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TIME SERIES ANALYSIS AS A TECHNIQUE FOR
ANALYZING THE POLICY IMPLICATIONS OF THE
EXPENDITURE PHASE OF THE DEFENSE BUDGET.

Richard W. Sherwood

NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

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ANALYZING THE POLICY IMPLICATIONS OF THE
EXPENDITURE PHASE OF THE DEFENSE BUDGET

by

Richard W. Sherwood

June 1977

Thesis Advisor:

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BUDGET

by

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Submitted in partial fulfillment of the
requirements for the degree of

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from the
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ABSTRACT

This thesis describes, in general overview terms, the budget execution process from the time the appropriations bill becomes law until the disbursement of funds to the private sector emphasizing the roles played by all the elements which make up the execution process. The Department of Defense budget execution process is then analyzed based on incurred obligation and expenditure patterns using time series analysis techniques. Results of the analysis are displayed graphically and the policy implications are discussed. Areas for further analysis are suggested.

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I. INTRODUCTION

The budget process has four main phases: (1) executive formulation and transmittal; (2) congressional action; (3) budget execution and control; and (4) review and audit. Most discussion and analysis of federal budgeting focuses on formulation, transmittal and congressional action. The topic of this thesis is an overview of the federal budget execution process as it applies to the Department of Defense and some facets of its controllability. In most instances one is able to find, in one source, a description of the entire budget formulation and congressional process. This is not the case with the execution process. Most literature concentrating on the budget cycle merely mentions the execution phase as falling action to the climax, the appropriations bill. This thesis will attempt to bring perspective to the budget execution process and illustrate the many players which influence this phase of the budget cycle. Figure 1 gives a quick view of the players involved.

The emphasis is directed toward the Department of Defense and the role it plays due to the commonly accepted analysis that, of the portion of the budget which is considered controllable, the greatest portion is the defense budget. This is strongly supported by comments from the popular press reflecting the sensitivity of our economy to the execution of the defense budget and the efforts to control it.

The second part of this thesis attempts to evaluate the applicability of the expenditure phase of the Department of Defense budget as a policy instrument using time series

analyses . The basic assumption is that budget execution is the correct measuring device for evaluation of the effect of our planning process. It should follow that this would necessarily have to be a very powerful policy control variable and it would further follow that we should expect to find correlation between desired policy achievement and Department of Defense fiscal activity because of the greater degree of controllability in the Defense budget.

The actual organization of the analysis in this thesis includes background on the defense budget execution process, the roles of various elements therein and discussion of the time series modeling. These sections are followed by the analysis of DOD outlays and obligations and their implications. Conclusions and signifiance of the results are discussed and possible areas for further study are suggested.

II. DESIGN OF THE EXECUTION PROCESS

The procedure for budget execution evolves in accordance with the distribution of power within a government. The authority of the legislative vis-a-vis the administration will be reflected in budget execution. The carrying out of the budget is an executive responsibility. Within the administration the role of the chief executive and his staff agencies, in their control of operating departments and agencies, will be manifest in the techniques which are employed to carry out the governments financial plan [Burkhead, 1956].

Once budget formulation is complete and after the Appropriation Act has been signed into law by the President the wheels of executive authority must start in motion to insure the budget will accomplish its purpose. The primary authority exists in the Office of Management and Budget and in the Department of the Treasury. It is these two elements within the executive which will control the execution of the budget.

The Office of Management and Budget (OMB) was established pursuant to Reorganization Plan no. 2 of 1970. Its powers came from the Budget and Accounting Act of 1921 which established the Bureau of the Budget as a staff agency of the President. Although directly responsible to the President, the Bureau was originally placed in the Treasury Department. When the Executive Office of the President was created in 1939, the Bureau was placed in that Office.

The Budget and Accounting Act made it the Bureau's duty

to assist the President in the preparation of the annual budget. The act gave the Bureau the authority "to assemble, correlate, revise, reduce, or increase the estimates of the agencies within its span of control." A further increase in power is seen by the General Appropriations Act of fiscal year 1951 which gave the Bureau precise legal authority for the establishment of reserves against appropriations to effect economies and savings during the fiscal year.

The government, like most individuals and business, typically commits itself to expenditures before the expenditures are actually made. This is seen in the case of hiring employees and letting contracts. Before any Government agency can make an expenditure, permission must be obtained from the Congress to commit or obligate the Government for the expenditure. An authorization by Congress gives approval of functions or activities of an agency. In other words, the Congress passes legislation authorizing or approving activities such as defense research and development. For many agencies, the authorizing legislation specifies a maximum amount that can be appropriated [Capra, 1974], and in essence says the agency can now seek appropriations for its approved programs. The legislation which grants this authority to commit the Government is referred to as "obligational authority."

The obligational authority (also called budget authority) provided by the Congress in the various appropriations bills are of several types. The most common type is seen in the appropriation of funds. An appropriation allows an agency to commit the Government by orders, contracts, and agreements for specific types and amounts of future expenditures. Appropriations are generally defined as new obligational authority (NOA). It further allows the agency to make future expenditures as commitments are fulfilled. An agency's total obligational

authority (TOA) includes not only NOA but also unobligated balances from prior years' appropriations. Agencies generally have two years after the expiration of obligational authority to complete the financial transactions (disbursement of funds) associated with that authority [31 U.S. Code, 701-706]. Figure 2 illustrates the relationship of these authorities.

"Contract authority" is another type of obligational authority. It is very much like the appropriation except it provides no power to make expenditures associated with the obligation. Contract Authority permits obligations in advance of appropriations and therefore requires subsequent appropriation or some monetary receipts for liquidation. Typically they are definite in amount, e.g., the dollar amount of air-navigation facilities that can be contracted for in a particular year. Sometimes they may be indefinite in amount, e.g., contract for the building in connection with the extension of the Capitol. Contract authorizations are used generally where more than a year is expected to lapse between the time an obligation is placed and the expenditures become necessary. It is used primarily in the procurement activities of defense. This is an area which does not have the positive control of an appropriation and over which Congress may desire to exercise close supervision.

Obligational authority also exists in our "authority to spend debt receipts" which allows an agency to incur obligations and make payments for specified purposes out of borrowed monies. Where such authority pertains to borrowing from the Treasury, it is authority to spend "public" debt receipts. Authority for a Government agency to borrow directly from the public or from a Government-administered fund available for investment is authority to spend "agency debt receipts." This type of authority does not always come

in appropriations bills and is frequently referred to as "backdoor financing." For example, the Treasury may be authorized to provide public debt receipts to an agency, often in exchange for notes of the agency. Since the dollar balances in the bank accounts of the Treasury are not distinguishable by source, whether obtained from taxes or borrowing, this type of authorization represents an appropriation to commit and to spend government funds just like any other appropriation. This type of funding is supposed to be the exception not the rule and is almost unheard of in defense areas [Capra, 1974].

The fourth and last form of budget authority comes in the form of "reappropriations." This allows an agency to incur obligations and make payments amounting to part of or all the unobligated balance of an otherwise expired one-year or multiple-year appropriations, whether for the same or different purpose. Reappropriations are counted as budget authority in the year of the congressional action which authorizes such action. Figure 3 illustrates these four sources of budget authority and how they are combined to result in total obligational authority.

Budget authority may be classified as definite or indefinite, permanent or current. Definite authority is a definite sum or amount of resources made available. Indefinite authority is not specified by amount and may be related to some other expected income, e.g. receipts for a particular tax revenue. Current authority is new budget authority enacted by Congress in or immediately preceding the fiscal year involved. Permanent authority is new budget authority made available each year by virtue of one time or standing legislation and does not require further action by Congress.

Appropriations are granted to accounts in various forms

and time frames. "One-year accounts", which are the most common, allow an agency to incur obligations within only one fiscal year, the grant expiring at the end of the year. If obligations are incurred in the year, obligated balances of such appropriations remain available indefinitely for the making of expenditures in payment of the obligations.

"Multiple-year accounts" are available for incurring obligations for a specified period of time in excess of one year with the obligated balances remaining available indefinitely for payment of obligations. These appropriation accounts are used primarily for programs of an unusual seasonal nature or as applicable to defense characteristics such as Navy shipbuilding.

"No-year accounts" are available for both obligation and expenditure until the purpose is accomplished. This type of appropriation is used primarily for certain types of benefit payments and for construction of projects where a time limit would not appreciably add to the system of expenditure control. Other examples of no-year appropriations include some research and many trust fund appropriations. Figure 4 illustrates the various categories in terms of time frames of appropriations accounts.

Accounts are not necessarily permanent in nature and there is also a classification to cover these. Unexpired and expired accounts are as the name implies. It should be noted that in expired accounts, where the authority may no longer exist for incurring obligations, outlays are still permitted to pay obligations previously incurred.

In considering the objectives of a system for budget execution a few thoughts should come to mind. Congress, having approved the budget through the appropriation process, had some basic objectives, reasoning, or intent and

these should be preserved. Just as budget preparation must be concerned with structuring the efficient use of scarce resources, budget execution should be concerned with carrying out that efficiency. A third thought which is always prevalent is the nation's economic conditions which require some programs to inevitably change over time. The ability of a budget execution system to cope with this is largely dependent on the way in which the budget authorizations are written by the legislature. To insure the spirit of flexibility, the budget authorization should be permissive, not mandatory, i.e., the authority to incur obligations and to make expenditures must not be mandatory. A balance of permissiveness and flexibility with positive control must be struck.

III. THE OFFICE OF MANAGEMENT OF THE BUDGET

Following congressional passage of an appropriations bill and signature by the President, agencies must submit to the Office of Management of the Budget (OMB) a proposed plan for apportionment. This plan indicates the funds required for operations. Apportionment basically means the time rate at which the obligational authority can be used.

The apportionment process is intended to prevent obligation of an account in a manner that would require deficiency or supplemental appropriations and to achieve the most effective and economical use of amounts made available. In apportioning any account, some funds may be reserved to provide for contingencies or to effect savings, pursuant to the Antideficiency Act. They may also be deferred or proposed for rescission for other reasons, pursuant to the Impoundment Control Act of 1974.

Budget authority, balances, and other budgetary resources are stated in terms of authority to incur obligations. The operations of the apportionment system and the fundamental controls are on an obligational basis. Thus, apportionments are generally based on obligations. However, OMB, at its option, may apportion accounts on some other basis that will provide effective controls.

Under Executive Order 11541, of July 1, 1970, responsibility for making apportionments was delegated to the Director of OMB. OMB may make apportionments or reapportionments, including the withholding of funds, on the basis of agency requests or on its own initiative. The

authority is usually apportioned by quarters over the period of the appropriations to insure the obligational authority is not spent faster than Congress intended and to insure the most economical and effective use of the funds. However, when approved by OMB, amounts may be apportioned for other time periods; for activities, projects, objects, or for a combination thereof. Budgetary resources are not apportioned for periods longer than one fiscal year.

In the case of No-year accounts and multiple-year accounts in which funds are available beyond the current fiscal year, apportionments will cover the anticipated financial requirements for the current year. Funds not required for the current year but included in the appropriations are enumerated in the apportionment request by appropriate agencies.

Agencies can request changes in the level or time periods covered by apportionment. Consideration is given to apportioning funds for time periods other than calender quarters or at levels other than the appropriations account, whenever such periods or levels are more representative of program activities and will facilitate their execution.

Unobligated balances of apportioned funds become part of the new fiscal year's apportionment in the majority of cases. New apportionments are reduced by any portion of the unobligated balance estimated to be brought forward on the most recently approved apportionment request received from an agency or department. OMB works under the premise that new apportionment action for a fiscal year will be independent of all apportionment of the preceding year [OMB Cir. No. 34]. That is, unobligated balances which were identified for expenditure during the last period of apportionment are treated as new funds to be apportioned accordingly.

OMB can also exercise its power by withholding resources from obligation on its own initiative or upon the request of an agency. Budgetary resources may be deferred as reserves to provide for contingencies under provisions of the Antideficiency Act; or they may be deferred for other reasons under the Impoundment Control Act, except that funds available for only one fiscal year may not be deferred throughout that year.

The Impoundment Control Act specifies that whenever the President determines that all or part of any budget authority will not be required to carry out the full objectives or scope of programs for which it is provided, the President will propose to Congress that the funds be rescinded. Likewise, if all or part of any budget authority limited to a fiscal year is to be reserved for the entire fiscal year, a recission will be proposed. Recission of budget authority may also be proposed as a means for initiating fiscal policy. Generally amounts proposed for recission will be withheld during the time the proposals are being considered by Congress.

The apportionment of funds is not to be regarded as resolving any question as to the legality of using funds for the purpose for which apportioned. Any question as to the legality of using funds for a particular purpose is resolved through other channels.

Apportionment action by OMB implies approval of, or concurrence with, any comments inserted on the apportionment request by the agency. Where OMB specifically disagrees with any such comments, it will be noted on the approved apportionment documentation.

Agencies submit their apportionment requests indicating the time frame and levels desired. Initial apportionment

schedules from agencies reflecting the year's schedule is submitted to OMB by 21 August. In those cases where all of the budgetary resources for an account results from current action by the Congress, initial apportionment schedules might not be submitted until 10 days after the approval of the appropriation or substantive acts providing new budget authority or by 21 August, whichever is later [OMB Cir No. 34].

In those cases where initial apportionment requests are submitted by 21 August, OMB will notify agencies of the action taken on the initial requests by 10 September (new budget time table) . Those requests which may have been delayed due to pending action by Congress will receive notification from OMB within 30 calendar days after the approval of the act providing new budgetary authority.

IV. DEPARTMENT OF DEFENSE CONTROL OF THE BUDGET

This section will review those elements in the execution process which influence the results of policy guidelines through control exercised by the Secretary of Defense. The Secretary of Defense can exercise control in the very beginning of the phase at the appropriations step and further extend this control through the allocation process, the obligation process and reprogramming activities. Transfers and impoundments can also be effective tools of control available to the Department of Defense.

A. APPROPRIATIONS

After the Appropriations Act has been signed into law by the President, the Act is sent to the General Services Administration (GSA) where a public law number is assigned and the law is published. The GSA has the responsibility for the National Archives and Reports Service whose function is to publish laws. After this action, a copy is sent to the Treasury Department, the Office of Management and Budget, the General Accounting Office, and to the Secretary of Defense and the separate services.

When Congress has not completed its deliberations leading to the enactment of the annual Department of Defense Appropriations Act by 1 October, it provides funding authority through a joint "continuing resolution" making interim appropriations available to the Department of Defense. The intent of the continuing resolution is to

provide funds to maintain operations at a minimum rate necessary for the orderly continuation of activities until regular appropriations are enacted. Passed on to the departments within DOD, the continuing resolution is called the expense operating budget and is further allocated to subordinate agencies within the departments. The expense operating budget is the budget authority until the appropriations bill is passed and signed into law.

Once the Defense Appropriation Bill is passed, it is binding as to how much the DOD can obligate thereunder and, within its broad purposes, what can be bought.

The apportionment process , exercised through OMB, reflects Presidential control and can restrict the rate or purpose of obligations as provided by law. Apportionments are made on the basis of hearings conducted by OMB, Office of the Secretary of Defense (OSD), and DOD components wherein apportionment requests are considered. This apportionment process also serves the important function of updating the budget which was submitted to OSD more than a year previously. Once the apportionment is released by OMB, it becomes the Secretary of Defense's authorized obligation rate.

The Secretary of Defense exercises his primary financial control by establishing the rate of obligations of funds for the DOD components based on the OMB apportionment release. Departments of the Army, Navy, and Air Force will submit to the Assistant Secretary of Defense Comptroller their proposed operating budgets and financial plans for review in anticipation of the formal submission of an apportionment request based on the appropriations act. This action is the motivation for the review and update of the budget. Submission of this plan and budget also requires the agency to prepare monthly schedules for obligations and commitments

for the first half of the coming fiscal year. Figure 5 illustrates the interaction between these elements in the apportionment process.

Upon receipt of these plans and budgets, analysts from OSD evaluate in substantive detail and make their recommendations to the Comptroller based on evaluations of program proposals (feasibility, desirability, priorities, timing, etc.), procurement, and research and development line items. It is at this point the Secretary of Defense can exercise additional financial control by deferring programs until later in the budget execution program. This is used to restrict the flow of funds, as well as to control programs by withholding funding authorization until complete justification is provided.

To meet changing needs, the Secretary of Defense has the authority, with the approval of the Office of Management and Budget, to transfer funds from one appropriations account to another if such transfers do not exceed statutory limits. There are four other methods besides the transfer authority available to OSD and the Department of Defense components which provide flexibility within appropriations. These are Supplemental Budget, Contract Authorization, Deficiency Budgets, and Reprogramming.

Supplemental Budgets and Deficiency Budgets are in essence additions to the annual budget proposed by the Secretary of Defense to request funds for major unforeseen emergencies during the current year. Statutory authority under which contracts or other obligations may be entered into prior to an appropriation for the payment of such obligations was discussed under contract authority. Reprogramming will be discussed later.

The Secretary of Defense's funding authorization

provides agencies with a document which establishes authorized funding levels; i.e., obligational authority for both direct and reimbursable programs for each appropriations and expense authority for military personnel of the Active Forces. Generally, this document establishes applicable program, budget activity, procurement line item, and program element distributions of the total resources for the year. These documents are revised during the course of the year to reflect appropriation enactment, releases from deferral, reprogramming or other actions which effect the funding authority.

Agencies submit monthly reports to the Office of Secretary of Defense reflecting the status of available funds. These reports are forwarded for review to the Office of Management and Budget and the House Appropriations Committee.

An annual report is prepared by the department Comptrollers and submitted to the Office of Secretary of Defense in December as the previous end-of-year (30 September) unobligated and unexpended balances, as well as the unpaid obligations, of all appropriations and funds. This report is submitted to the Treasury Department for establishing year-end balances and to withdraw or restore funds as necessary.

B. ALLOCATION

Following the establishment of the rate of obligation, which is quite an involved process, the Secretary of Defense allocates funds to responsible officials in their organizations. These allocations are usually divided into sub-allocations, allotments, and sub-allotments or are

included in operating budgets at the user level to make funds available for commitment, obligation and expenditure. A commitment is a reservation of funds based upon currently directed use leading to obligations. An obligation is a liability; e.g., a firm contract for goods or services. An expenditure is payment of the obligation. Allocations, commitments, obligations, and expenditures are carefully controlled to avoid over spending.

A second level of apportionment occurs within agencies once the obligational authority is distributed by the Office of Management and Budget. Each agency is required by law to have a system of administrative control of their funds for the following purposes.

1. To restrict obligations or outlays against each appropriation or fund to the amount of the apportionments of such appropriation or fund.

2. To enable the agency head to fix responsibility for the creation of any obligation or the making of any outlay in excess of an apportionment or reapportionment.

By the time the appropriations bill for a fiscal year is enacted, the agency's plans for the fiscal year must be brought up-to-date. The revisions take account of changes in the amounts expected to become available and in conditions that effect the agency's program. The plans at this stage are usually more specific than they were at the time the original estimates were prepared. The revised plans are usually prepared in the same office that prepared the original budget estimates, and are again reviewed and consolidated at successive levels in the agency to serve as a basis for both the apportionment requests to OMB and for allotments within the agency. Agency heads determine the rate of allotments by month or quarters to the various

Administrative units within the agencies. As a result, additional restrictions may be placed on the use of obligational authority granted by the Congress provided it does not conflict with the Congressional Budget and Impoundment Control Act of 1974.

Suballocations are transfers or delegations to the head of another office, bureau, or command of some portion of the authorization granted to an allocation holder. The suballocation document states that all financial control, jurisdiction, and responsibility for amounts allocated are passed to the recipient.

An allotment is an authorization granted within and pursuant to an allocation or suballocation for the purpose of incurring commitments, obligations, and expenditures.

The operating budget concept consists of an approved operating plan which is the basis of authorization and financial control of resources available for the execution of program or programs of the indicated organizational or command level.

C. OBLIGATIONS

A crucial step in the spending process exists in the obligation of funds. Many decisions regarding the timing of obligations are initiated at the agency level. If an agency fails to obligate by a certain time, the funding authority lapses and reverts to the Treasury. Prior to 1954, administrators managed to retain access to funds by including them among a fluid concept called "obligated balances." The term meant different things to different people [Fisher, 1975]. Even the definitions by GAO and the

Bureau of the Budget (OMB today) did not agree. Reports on available balances were often misleading.

In 1954 Congress established legal criteria for obligations, requiring documentary evidence of binding agreements and other liabilities on the government. This was a step in the right direction for gaining control but much confusion remained. Large end-of-the-year obligation efforts were experienced leading to the 1955 act of additional tightening of control by which not more than 20 percent of any funds made available in an appropriations act could be "obligated" and/or "reserved" during the last two months of a fiscal year [Parker, 1974-75].

Criticism of these carry over balances continued. The Hoover Commission emphasized that Congress had no effective control over the annual budget surplus or deficit, since there was no direct relationship between what was appropriated and what was actually obligated or spent. Part of this dilemma was a result of the practice of appropriating on a no-year or multiple-year basis creating large carry over balances.

Although the Hoover Commission pointed out the shortcomings in carry over balances and contract obligations, no action was taken to effect a change. The magnitude of carry over balances increased from year to year. The budget for fiscal year 1976 showed \$493.9 billion in unspent authority available from prior years. Only \$111.6 billion was expected to be spent in the fiscal year 1976. \$354.3 billion was expected to be spent in future years. \$27.9 billion was scheduled to expire. By the end of the 1976 fiscal year the total amount of carry over balances was expected to reach \$502.4 billion (figure 6). Consider Aron Wildavsky's recipe for being a poor nation, not only lack of wealth but also the inability to

spend what is available. Wildavsky points out that he found underspending as high as 75% of the budget in poor nations where they lacked the capacity to absorb expenditures [Wildavsky, 1974]. It is not likely that this country would be classified as poor but Wildavsky's point is an interesting one for reflection.

Agencies also have access to other funds as the fiscal year unfolds. Such funds are called "deobligations", "recoveries", or "recoupments". They represent funds that have been tied up but, for various reasons, are later made available for agency use. In 1962 the House Appropriations Committee noted, with displeasure, the Navy's budget for fiscal year 1962 had estimated \$30 million in recoveries from prior appropriations . Afterwards the Navy discovered recoveries would come to approximately \$227 million [Fisher, 1975].

D. REPROGRAMMING

In the area of budgetary control within the Department of Defense, reprogramming is an effective technique of budgetary control in the execution process. Reprogramming is essentially a process of moving funds within a single appropriations account. One might think that since no additional money is required, and since the Congress usually appropriates funds for groups of programs rather than for individual programs, adjustments within appropriations would not be a matter of Congressional review. Presidents of the past have argued that appropriations are to be administered by the executive branch of government and Congress should not get in the way of this function. President Eisenhower asserted in a message to the Congress that, "once an appropriations is made, the appropriation must, under the

Constitution, be administered by the executive branch of the government alone, and the Congress has no right to veto Executive action to prevent Executive action from becoming effective [House Document No. 218, 84th Cong.]. But Congress rejects this view and closely protects its ability to execute the budget in this area.

Congress appropriates lump-sum amounts to the Defense Department. It is the understanding of the Appropriations Committees and of the Congress that the monies will be spent in accordance with the original departmental justifications as appropriately amended.

As the budget year unfolds, new and better applications of money come to light. Reprogrammings are made for a number of reasons, including unforeseen developments, changing requirements, incorrect price estimates, wage rate adjustments, changes in the international situation, and legislation enacted subsequent to appropriations.

Reprogramming is entirely nonstatutory and it operates at the level of subaccounts in the appropriations structure. Though it is nonstatutory, agencies of the Executive branch have a strong incentive to comply with Congressional wishes in order to avoid retaliation through lower funding of future programs. Reprogramming was not even part of committee records until the mid-1950's. As the practice of shifting funds persisted over the years, members of the Appropriations Committees began to require certain amounts of discipline in reprogramming. Reprogramming procedures have come to require regular reporting by the Department of Defense and prior approval of selected items by designated committees.

Congressional control over defense reprogramming has progressed through a number of stages. The Appropriations

Committees have required the Defense Department:

1. To keep them advised of major reprogramming.
2. To submit semiannual tabulations of reprogramming actions.
3. To report more frequently.
4. To obtain prior approval from the Appropriations Committees for certain categories.

Due to the vagueness of the requirements the Defense Department and the appropriations committees battled over the degree of explicitness in reprogramming actions.

The Defense Department has written, rewritten, and re-written their directive on reprogramming procedures to satisfy requirements of the committees. The emphasis in the reprogramming directive is on the prompt notification requirement for any reprogramming action, single or cumulative, that exceeds these dollar thresholds:

1. An increase of \$5 million or more in a budget activity in the military personnel and operation and maintenance appropriations.
2. An addition of \$ 5 million or more in a procurement line item or the addition to the procurement line item base of a new item in the amount of \$2 million or more.
3. An increase of \$2 million or more in any budget subactivity line item in an appropriation for research development, test, and evaluation, including the addition of a new budget subactivity line item of \$2 million or more, or the addition of a new budget subactivity line item, the cost of which is estimated to be \$10 million or more within a three-year period.

No comprehensive record of the number and dollar amount

of reprogramming actions by the Defense Department has been published. Occasionally, in committee hearings, committee reports, and committee reprints, figures are available for particular years. Figure 7 illustrates program activity experienced in the past.

Reprogramming statistics rarely show the magnitude of below-the-threshold actions (internal actions by the Defense Department that are carried out without committee notification or approval). Internal reprogramming for fiscal year 1964 through 1967 accounts for an average of \$1.1 billion a year.

It should be understood that a reprogramming action is often made up of several reprogrammings with funds taken from several projects and reallocated to other projects. Thus a large number of reprogrammings (sometimes as many as 30 to 40) will be packaged together and presented as a single request and be given a single DOD serial (identification) number.

Another item of interest is the breakdown between reprogramming actions that are subject to prior approval by the designated committees and those that are merely sent to the committee for notification. During the period 1 July 1967 to 19 February 1968 the Defense Department sent 97 formal reprogramming actions to the review committee. Of the \$3.6 billion involved, prior approval accounted for only \$122 million. The balance consisted of submissions for notification [House Appropriations, 90th Cong., 2d Sess.].

Though reprogramming offers the Secretary of Defense an effective tool for preserving management flexibility it also provides the opportunity for substantial re-emphasis of policy. One such possibility is requesting funds for a popular program today, knowing Congress will provide the

funds, and reprogram for a disfavored project tomorrow.

An element of risk accompanies each reprogramming proposal. Whenever the Defense Department requests that funds be shifted from one program to another, it necessarily admits the following:

1. The original program was overfunded or
2. There has been slippage in the original program thus freeing additional funds or
3. The original program has been downgraded in priority.

The resulting effect is that of alerting the Appropriation Committees to potential areas for retrenchment and economizing the next budget cycle.

There are numerous irregularities which Louis Fisher [Fisher, 1975] points out in his analysis of reprogramming from using reprogramming to remedy indecisiveness at the time of budget submission to starting new programs using the "foot-in-the-door" technique for obtaining additional funds. These irregularities are receiving more attention in Congress. Committee action in reprogramming and involvement has become more acute and we find the committee members much more sensitive to the issues of reprogramming. They are paying more attention to reprogramming requests, asking more questions and requiring the spirit of the original appropriations be followed in subsequent reprogramming action.

The scope of reprogramming by the Defense Department helps to underscore the highly tentative nature of its budget estimates and its involvement in the execution process.

E. TRUST FUNDS

An interesting component of the budget which must be mentioned is Federal and trust funds as execution tools. The basic unit of classification is the appropriation or fund account. The functional classification arrays budgetary data according to the major purpose served by the unit being classified, usually a budget account. Agency activities are financed through Federal funds and through trust funds.

Federal funds are of four types. The General fund is credited with receipts not earmarked by law for a specific purpose and is charged with payments from revenues and general borrowing. Funds for DOD's operations and maintenance accounts are from the General fund. Special funds contain Federal receipts earmarked for specific purposes other than for carrying out a cycle of operation; e.g., ship construction. Public Enterprise (revolving) funds finance a cycle of business-type operations in which outlays generate receipts, primarily from the public. Examples are laundry service at the Naval Academy and the Federal ship financing fund. Intergovernmental Revolving and Management funds facilitate financing operations within and between Government agencies; e.g., service stock funds.

The trust funds are established to account for receipt and expenditure of monies by the Government for use in carrying out specific purposes and programs in accordance with the terms of a trust agreement or statute. These monies are not available for the general purpose of the Government. Nearly all trust fund appropriations are made available for obligation until the objectives have been attained (no-year-appropriations). Examples are special services, special studies, and projects for the service

agencies.

F. TRANSFERS

The vehemence of the current law concerning transfer of funds stems from a history ranging from outright abuse of the concept of transferring funds to apparent conscientious application.

The current law echoes the principle, "no money appropriated for one purpose shall hereafter be used for any other purpose than that for which it is appropriated", by declaring that except "as otherwise provided by law, sums appropriated for the various branches of expenditures in the public service shall be applied solely to the objects for which they are respectively made, and for no others"[Fisher, 1975]. Exceptions to that general rule are fairly common, sometimes supported by statutes, sometimes not.

The Department of Defense Appropriation Act contains language which grants to the Secretary of Defense authority, with the approval of the Office of Management and Budget, to transfer funds between appropriations or funds in the current fiscal year upon determination that such action is necessary and in the national interest . The transfer authority is normally stated as a dollar limitation not to exceed a specified amount available to the Department of Defense for military functions (except military construction). Transferred amounts are merged with and made available for the same purpose and time period as the appropriation or fund to which it is transferred. The Appropriation Act also provides that additional criteria must be applied to the use of the tranfer authority and to requests for other proposed reprogramming actions.

Transfers are not authorized unless for higher priority items, based on unforeseen military requirements, than those for which originally appropriated and in no case where the item for which funds are requested has been denied by the Congress [Fisher, 1975]. The Secretary of Defense is required to notify the Congress promptly of all transfers.

G. IMPOUNDMENTS AS A POLICY INSTRUMENT

The use of impoundment by the Executive Department is another means available for exercising control in the budget execution process. Defined as the withholding of funds already appropriated by Congress to disallow their expenditure, impoundments have been used sporadically from the 1930's through the 1960's. It was not until the Nixon years that the issue of impoundments caused a general balk by the Congress. Hearings and proceedings followed and as a result general controls were placed on this policy instrument.

Impoundments can be categorized by four types [Fisher, 1975].

1. Routine actions taken for purposes of efficient management.
2. Withholdings which have statutory support.
3. Withholdings that depend on Constitutional agreements.
4. The impoundment of domestic funds as part of policy making and priority setting by the administration.

The executive branch has regarded appropriations as permissive vice mandatory and routine withholdings often occur to effect savings because of changing events and for basic managerial reasons. Savings are realized whenever

expenditures fall short of appropriations and it should be considered wasteful to spend more just because you have the funds. One can also see the use of impoundments to force a savings situation by making managers perform their functions with the reduced amount of funds caused by the impoundment.

Under this category of managerial type impoundments, flexibility is required to meet the change in events in the environment. If later events make an expenditure unnecessary, administrators are expected to withhold funds and return them to the Treasury. There may be numerous reasons for suspending a program or payment. Funds may be withheld on a temporary basis to see if a recent environmental change may effect a better way of spending those same funds for their intended purpose. Impoundments also provide the administrator an immediate tool for termination of funds being used improperly which would otherwise take far too much time to uncover through the normal investigation process and thus suffering an excessive loss.

In many cases the President is authorized or directed by law to withhold funds. Congress can direct a spending cut and legislate reduction in spending for a lesser amount leaving the balance of the directed cut to be fulfilled by the President. Congress can also enact ceilings on expenditures thereby giving the Administration additional statutory authority to impound funds.

The Antideficiency Act ,as amended in 1950, authorized the President to establish budgetary reserves "to provide for contingencies, or to effect savings whenever savings are made possible by or through changes in requirements, greater efficiency of operations, or other developments subsequent to the date on which such appropriation was made available." Additionally there are even instances were individual

appropriations bills will often provide some measure of impoundment authority. This would be seen in the literature of an appropriation which may direct withholding a certain amount of funds subsequent to a particular event taking place such as a physical, performance, or dollar threshold level of an activity .

The Supreme Court has acknowledged the need for some discretion and judgement on the part of executive officials in the handling of public funds. A continual struggle exists between the legislature and the executive. Congress views impoundments as an encroachment upon their ability to make policy and decide government policy while the Executive Department claims that impoundment is consistant with its constitutional duty to, "take care that the laws be faithfully executed", and "was authorized by the constitutional provisions that vest the executive power with the President [Fisher, 1975]."

In the areas of foreign affairs and national defense there is considerable conflict between these two branches of government concerning who should have the preponderance of power in deciding policy. With regards to foreign affairs, numerous statutes authorize the withholding of funds . When the President acts under such authority, it is in support of congressional policy, not antagonistic to it. Most of the conflict exists in the area of national defense and the "Commander-in-Chief" clause to impound funds. To protect its perogatives, Congress has resorted to "floors"(minimum levels) for military forces which, to a certain degree, restrict the magnitude of impoundments. In the area of procurement, Congress is particularly sensitive to policy making by impoundments and thay are paying more and more attention to procurement practices.

The area of administrative policy-making falls in a

category by itself due to its nature of pure policy-making without statutory authority and unrelated to Commander-in-Chief functions. Impoundments in this category are a result of the president's direct withholding of funds to suit his needs, desires, and/or wishes concerning policy. Support of his actions by a few powerful congressmen can facilitate the success of his actions. These actions can be in pursuit of anti-inflationary goals, changing of executive priorities, and thwarting off unwanted projects initiated by Congress.

V. THE TREASURY'S ROLE IN BUDGET CONTROL

The Federal Government, like any enterprise, needs a financial organization to estimate its financial needs; receive, keep, and disburse its funds; and record and report its financial information. The Constitution placed the fund raising and fund granting authority in the Congress. The Congress determines the purpose for which the funds will be spent and the ways in which the revenues will be raised. The duty of the Treasury Department is to conduct the flow of funds in the manner prescribed by Congress (figure 8).

Thus one finds another link in the budget execution process. The Treasury Department, which has an extremely broad operating base, has numerous bureaus to carry out its functions. The bureau which deals explicitly with central accounting, reporting, disbursing, and bank services is the Bureau of Government Financial Operations which is a product of the recent merger of the Bureau of Accounts with the old Bureau of Operations.

The primary fiscal concern of the Treasury Department is having sufficient funds available for disbursement when needed. Though the appropriation actions by Congress control the "purse" they do not in themselves create public funds for the Treasury to disburse.

The Treasury Department maintains cash balances based on the current disbursing needs of the Government. Government checks drawn on the Treasury clear through banking channels against the available funds of the Treasurer in the Federal Reserve System. The Treasury does not have branch banks

throughout the United States and therefore uses the Federal Reserve System. The Federal Reserve Banks and their 24 branches have been designated as fiscal agents of the Treasury Department. In effect each bank performs all the services that a branch office of the Treasurer would perform.

The Federal Reserve Banks and the Federal Reserve Board are components of the Federal Reserve System [Figure 9]. The system is designed as follows:

1. The Board of Governors consists of seven members appointed for 14-year terms by the President and confirmed by the Senate. It exercises general supervision over Federal Reserve Banks and appoints three directors of each Federal Reserve Bank.

2. There are 12 Federal Reserve Banks with 24 branches. The reserve banks hold the member banks reserve accounts, issue Federal Reserve notes and act as banks of deposit and as fiscal agents of the Government.

3. The Federal Open Market Committee directs the system's open market operations conducted by its agent, the Federal Reserve Bank of New York.

4. The Federal Advisory Council consists of twelve members from twelve Federal Reserve Banks. The Council periodically confers with the Board of Governors on general business conditions and makes recommendations to the board on matters under their jurisdiction.

5. 6,000 member banks consisting of all national banks and such state banks and trust companies as have been admitted.

The Federal Reserve System has the ultimate responsibility for regulating the supply of money. Money is defined in two categories, M1 and M2. M1 consists of cash and demand deposits in the hands of business and households.

M2 includes M1 plus time depositis. Whereas all the functions of the Federal Reserve System are more or less routine, the goal of correctly managing the money supply entails the making of basic and unique policy decisions of a non-routine character. Changes in the level of M1 and M2 greatly effects economic conditions as outlined below:

Federal monetary policy influences commercial bank reserves

-which-

Influences the supply of money

-which-

Influences the interest rate and the availability of bank credit

-which-

Influences investment spending, output, employment, and the price level.

Most of the Treasury receipts go into tax and loan accounts. These accounts are in commercial banks that have qualified as special depositories [Prochnow, 1960]. Those receipts not going into the special accounts will go into the Federal Reserve Banks or one of its branch banks. The Reserve Banks administer these accounts on behalf of the Treasury, maintaining records, making sure the depository has collateral (usually government securities) at the Reserve Bank at least equal to the amount of the deposits, and notifying the depository when the Treasury decides to shift some of its balances at special depositories to its accounts at the Federal Reserve Banks. This shifting is done to replenish balances against which checks are constantly being drawn.

Because the movement of money from private checking accounts or from tax and loan accounts in commercial banks to the Treasury accounts at the Federal Reserve Banks

represents a loss of reserves to the banking system, and because large sums can be involved (\$ 5 billion or more at quarterly tax payment dates, an amount in excess of a quarter of all bank reserves) every effort is made to keep such disturbing movements to a minimum.

In addition to exercising supervision of the Federal Reserve Banks and member banks, the Federal Reserve Board determines general monetary, credit, and operating policies for the system as a whole and formulates the rules and regulations necessary to carry out the purpose of the Federal Reserve Act by which it was established.

Each Federal Reserve Bank and branch forwards a daily transcript of transactions in the Treasurer's account to the Treasurer's office. All Government checks except those issued to make payments in foreign currencies are drawn on the Treasurer of the United States. The checks, when cashed, clear through commercial banks and the Federal Reserve System to the Treasurer for examination and payment.

Checks are reconciled by the "banker" rather than by the office writing the checks (for example the XM-1 tank project office in DOD). The integrated payment and reconciliation process is performed by the Treasurer of the United States in Washington on electronic data processing (EDP) equipment. Every disbursing office drawing checks on the Treasurer reports each month the number and amounts of checks issued. This information is recorded in the data processing system. As the checks are received for payment, the check information is entered into the EDP system and matched against the issue information. This process mainly performs the function of determining the outstanding balance.

Checks which match stop-payment orders are examined to determine whether payment should be refused. Checks which

do not match the amount reported as issued by the disbursing office are given detailed examination, and unless the difference represents an obvious alteration by the negotiators, the check is accepted for payment and a notice of discrepancy reported to the disbursing office for adjustment. If the difference represents an overpayment to the payee, the disbursing office must collect the overpayment and deposit the money in the Treasurer's account. If an undercharge to an appropriations or a fund is involved, an additional charge to the account must be processed. Check alterations or forgeries are referred to the Secret Service for investigation and, where identification is made, the case is referred to the Justice Department for prosecution.

The Treasury Department maintains a system of central accounts to provide a consolidated record of the Government's financial transactions and to meet its responsibility for reporting on the state of the Government's finances to Congress and the public. These central accounts do not constitute an overall general ledger for all the Government's assets and liabilities. They do represent a set of accounts which reflect the assets and liabilities of the United States to which receipts and expenditures and the Treasurer's cash operations, including borrowings, are directly related on a month-by-month and annual basis. These accounts are posted on the basis of:

1. Reports from disbursing offices for the amounts of checks issued or cash payments made by the administrative agencies for which such offices disburse, and the related classification by account for the amounts of receipts and disbursements processed for the administrative agencies.
2. Reports from collection offices for tax and custom receipts deposited.

3. Reports from the Treasurer of the United States for the amounts of deposits received in his account and the amount of cash paid out of his account for checks drawn on his account.

Subsidiary to the central accounts are the individual appropriations, fund, and receipt accounts. Each month the Treasury Department prepares a statement of these individual accounts and transmits it to the administrative agency concerned to show the status (balance) based on the cash receipt and disbursement data recorded in these accounts. These statements serve as reconciliation media with the agency's books. The final fiscal year statement of the accounts is the basis for the official Combined Statement of Receipts, Expenditures and Balances of the United States Government issued by the Treasury Department. These same figures must also be used in agencies' budget presentations to Congress. Also subsidiary to the central accounts are individual accounts for each disbursing office's outstanding checks and for deposits in transit to the Treasurer's account.

VI. THE GENERAL ACCOUNTING OFFICE

The General Accounting office (GAO) is a nonpolitical nonpartisan agency in the legislative branch of the Government. It was created by Congress through the Budget and Accounting Act of 1921 and placed under the direction and control of the Comptroller General of the United States. The Act vested in the GAO all the powers and duties formerly prescribed for the Comptroller of the Treasury by statutes extending back to 1789.

Until the Budget and Accounting Act created the GAO, Congress relied on two main devices for the surveillance and control of public fiscal activities: the language of the appropriations acts, and a set of internal checks within the executive branch. Appropriation acts were written in great detail in an effort to control and guide the use of the funds appropriated. The internal administrative checks were designed to insure that, at each point in the expenditure of funds, a different official would have to verify the transaction, thus providing a measure of safety. These two devices were occasionally followed by congressional committee investigations.

The combination of these devices proved inadequate [Brown, 1973]. Use of the detailed appropriation language led, in time, to excessive specificity and proved self-defeating as executive departments struggled for a degree of administrative flexibility. Many devices were used, very often successfully, to circumvent congressional intent, including transfers of funds, carrying forward of unexpended balances, and incurring obligations in

anticipation of deficiency of future appropriations. The concept of internal administrative checks suffered a similar fate. Delays and confusion in the financial chain became commonplace, creating critical problems for the Treasury Department and its accounting system. These weaknesses in the apparatus of surveillance lead to reform efforts beginning with the Dockery Act of 1894 and culminating in the Budget and Accounting Act, which created the GAO[Brown, 1970].

The GAO constitutes the last of the elements of control in the budget execution process and performs the primary function of auditing. One of the purposes for audits of Government agencies is to make independent examinations for Congress of the manner in which the agencies are discharging their financial responsibilities. Another purpose for audits is to review the results of agency programs and activities. The Legislative Reorganization Act of 1970, as amended, provides for the Comptroller General to make such reviews when ordered by either house of Congress, on his own initiative, or when requested by any committee of the Congress.

The GAO finds its way into the budget execution process by receipt of a copy of the Appropriations Act once it has become law and performing its duties as outlined below. Established to act in behalf of Congress, GAO is required by the 1921 Act to:

1. Investigate all matters relating to the receipt, disbursement, and application of public funds and to make recommendations looking to greater economy or efficiency in public expenditure.

2. Make such investigations and reports as shall be ordered by either house of Congress or by any committee

of either House having jurisdiction over revenue, appropriations, or expenditures.

3. Furnish any such committee aid and information as it may request.

It was desired that the Comptroller General become the policeman of Congress rooting out inefficiency and gathering facts on public funds expenditure. The principal functions of the GAO are:

1. Auditing
2. Accounting and financial management
3. Direct assistance to Congress
4. Legal decisions by the Comptroller General
5. Overseeing campaign spending and reporting
6. Claims settlement
7. Records of management services

Of these principle functions, the auditing function is particularly influential in the budget execution process. The GAO is concerned broadly with the receipt, disbursement, and application of public funds. The Legislative Reorganization Act of 1946 directs the Comptroller General to make expenditure analysis to enable Congress to determine whether funds have been economically and efficiently administered and expended.

Within certain exceptions, GAO's authority and responsibility extend to all activities, financial transactions and accounts of the Federal Government. The exceptions relate principally to the activities of the Comptroller of the Currency, the Exchange Stabilization Fund established by the Gold Reserve Act of 1934, and the Federal land banks which are not subject to GAO audit. Interestingly enough, many activities carried on by

Government agencies, such as the nonappropriated fund activities of the Department of Defense (post exchanges, restaurants, canteens, vending machines, and personnel recreation and welfare activities) are not subject to GAO audit.

Implicit in the audit responsibilities of GAO is the responsibility to report information obtained as a result of the audit work. The Comptroller General is required to submit a report to Congress on its work at the beginning of each session. At any time the Congress is in session, the Comptroller General may make recommendations looking to greater economy and efficiency in the public expenditures.

When findings, conclusions, and recommendations in GAO reports do not require action by Congress, or are believed not sufficiently significant to be of interest to Congress or its committees, the reports are issued directly to department or agency officials concerned. For each GAO report containing recommendations to the head of any Federal Agency, that agency must submit to the Government Operations Committee a written statement of action taken. This statement must be submitted within 60 days after issuance of the GAO report. A similar statement is required to be submitted to the Appropriations Committee in connection with the agency's first request for appropriations submitted more than 60 days after the date of the report.

Another function performed by the General Accounting Office relating to the budget execution process is in the countersigning of warrants. The Act of 2 September 1789, creating the Treasury Department, required the use of warrants for withdrawing money from the Treasury pursuant to appropriations, for disbursements by the Treasurer of the United States, and for acknowledging the receipt of money into the Treasury. The law required these warrants to be

signed by the Secretary of the Treasury and countersigned by the Comptroller General. Although the use of checks has replaced the use of warrants for withdrawal of funds from an appropriations account, warrants are still used for recording appropriations on the books of the Treasury Department and the agency for which the appropriation is made. The only warrants requiring countersignature by the Comptroller General are those issued under continuing resolutions.

The recently enacted Congressional Budget and Impoundment Control Act of 1974 greatly expands the GAO influence and authority in the budget execution process. GAO furnishes additional assistance to Congress and its committees in matters of fiscal and budgetary information and controls including making program reviews and evaluations.

Specifically, the Comptroller General reviews possible efforts by the President, the Director of the Office of Management and Budget, the head of any department or agency of the United States, or any other officer or employee of the United States to establish a reserve or propose to defer budget authority without proper notification to Congress. Discovery of such efforts results in a report to both houses of Congress.

The Comptroller General is also empowered to bring suit to obtain release of budgetary authority when funds are not available as required by the impoundment control title.

Interest in limiting or making better use of expenditures is on the increase. This is evident upon review of the proceedings leading to the enactment of the Congressional Budget and Impoundment Control Act of 1974. Evaluation of programs, therefore, not only before they are

begun but during their operation as well , is becoming standard procedure. The General Accounting Office is moving from auditing after the fact to evaluation while the first sums are being spent.

VII. TIME SERIES DESIGN AND EXPERIMENTATION

Serving diverse purposes, a budget can be many things: a political act, a plan of work, a prediction, a source of enlightenment, a means of obfuscation, a mechanism of control, an escape from restrictions, a means to action, a brake on progress, even a prayer that the powers that be will deal gently with the best aspirations of fallible men [Wildavsky, 1974].

In the most literal sense a budget is a document, containing words and figures, which proposes expenditures for certain items and purposes. Presumably, those who make a budget intend that there will be a direct connection between what is written in it and future events. Hence we might conceive of a budget as intended behavior, as a prediction. If the requests for funds are granted, and if they are spent in accordance with instructions, and if the actions involved lead to the desired consequences, then the purposes stated in the document will be achieved. The budget thus becomes the link between financial resources and human behavior to accomplish policy objectives.

Control in the budget execution process is recognized as one of the major problems confronting today's leaders. Dissatisfaction with the degree of control over the budget is seen at all levels in the Legislature. If this side of the budget process can be controlled it would be fair to conclude that there might be a better chance at achieving the national goals.

The planning aspect of the budget has special emphasis

in this discussion and needs to be analyzed. Since funds are limited and have to be divided in many ways, the budget becomes a mechanism for making choices among alternatives. When the choices are coordinated so as to achieve desired goals, the budget might be called a plan. One must be conscious, however, of the possibilities of wide gaps between the intentions of those who make up the plan and their real accomplishments. Although the language of the budget calls for the achievement of certain goals through planned expenditures, investigation often reveals that no funds, or far too few funds, have been spent for these purposes, thus jeopardizing these goals.

Frustration arises among the planners of fiscal policy when spending targets are not achieved or are far exceeded. On 28 February 1977 top Carter Administration officials revealed federal government spending was \$7.6 billion less than what had been scheduled for the first four months of this fiscal year. They said they were baffled and perplexed. The frustration arises when the planners are counting on an anticipated or expected level of expenditures to complement the administration's economic stimulus package and then it is not realized. These budgeted expenditures were some of the assumptions in support of current economic policy and the mysterious "shortfall" required shifts in emphasis to maintain the momentum in achieving desired results. These abrupt shifts are not anticipated by the planners and become very sensitive issues in future planning operations.

Another recent problem of shortfalls in federal spending turned up in a significant way last year when the Ford Administration was equally baffled by what originally was estimated as an \$11 billion shortfall between March and October. At that time, much of the shortfall was attributed to a slowdown in defense spending and in part to lower

interest rate costs to the government than originally estimated on government bonds, bills, and notes.

In recognizing the fact that only a small degree of controllability in the federal budget exists and recognizing that the majority of the flexibility is in the area of defense expenditures, it would seem that further analysis in the area of defense expenditures would be useful for a better understanding of the policy planning and control capability of the budgetary process. Therefore the second half of this study explored the implications of the Department of Defense budget execution process as a policy variable using time series analysis. By employing the use of statistical regression techniques this study indentified the trend, seasonal and cyclical variations for the obligations and outlays of the Department of Defense. With these variations the study attempted to explain the responsiveness of obligations and outlays to directed control.

The first question to be answered was whether the reports of outlays issued by the Department of the Treasury were representative of the actual outlays reported by the Department of Defense. There is some concern that this was not the case due to the lag time in reporting and the techniques for gathering data for the reports.

Secondly one would expect a policy variable to fluctuate with the change of plans and goals. It would also seem if the variable were not regular in its process there would be less heard about the rush to year-end-spending and more concerning a rush to objective-spending; i.e., we would witness more spending (higher volume) in directed efforts at times which coincide with the change in emphasis rather than change in the fiscal year. "Year-end-spending" implies a very regular process and regularity is a conflicting

phenomenon in an environment which seemingly strives to meet policy needs.

To begin the analysis of the expenditure process one needs to examine the business world and hypothesize about the behavior of the businessman. First, one can find the business which focuses its decisions on the securing of promises from its clientel. These promises would be in the form of contracts, obligations made for services and similar agreements. This businessman will in turn proceed to conduct his operations and seek capitol based on these promises. His search for capitol, either debt or equity, influences the economy. Hence the obligation process of the federal government is a policy variable which can effect the economy in the manner just stated.

In a second instance one finds the business which focuses its decisions on cash management. This businessman will conduct his operations based on the cash situation which exists in his organization. Therefore, his effects on the economy will be regulated by a different variable. This businessman will first evaluate his cash situation and then decide upon an action for future operations. As might be expected, the cash oriented businessman will be more responsive to cash flows and such activities as tax payment and receipts for services. Hence the outlay process of the federal government is also a policy variable which can effect the economy in the manner just stated.

In essence then the businessman who responds to promises (contracts), relying more heavily on the status of his contracts and information on his search for debt and equity capitol for his management decisions, will act on his environment in different ways than the cash oriented operator.

Although not addressed in this thesis, the distinguishing characteristics of the promise versus cash businessman related to the pattern of the length of debt instruments for government contractors in defense would be an interesting future study.

One can observe these operations from the Department of Defense vantage point. Motivating actions are observed for both of these business operating (decision) techniques. On the one hand one finds the voluminous number of contracts which are entered. These obligations are the initiating force behind many business operations. The second technique, that of cash management, is also fed by the government in the process of liquidating obligations by issuing checks in payment for services.

This study looked at the regularity of obligations and outlays and attempted to evaluate them as policy variables. A first question in this analysis was, "Is there a significant difference between the pattern of obligation of Department of Defense funds and the expenditure of these funds?" The next question follows, "Which is a more regular pattern indicating the lesser influence as a policy variable?"

Recall from previous discussion that there exists explicit instructions on the obligation of funds by agencies. Decisions concerning the flow of cash outlays are not to be found at the agency level. This is understandable in that an agency normally disburses its cash assets when services have been rendered or in accordance with a contract's progress payments scheme; not when it would best suit an agency's policy. This point is made to emphasize that policy influence can exist explicitly in the area of obligations but less so in the area of outlays and expenditures.

Time series analysis deals with past patterns of performance. In making decisions military planners believe that the future follows the past with some degree of regularity, that what has happened in the past will, to a greater or lesser extent, continue to happen or will again happen in the future under similar circumstances. The collection, sorting, and evaluation of past performance data is a complex process. The discovery of regularities and patterns in the behavior of statistical information helps the planning process.

The first step in planning for the future consists then, of gathering observations from the past. In this concern one usually deals with statistical data which are collected, observed, or recorded at successive intervals of time which are generally referred to as "time series."

It is virtually impossible nowadays to avoid seeing the use of graphs of time series to show the behavior of stocks, bonds, sales, employment, etcetera. This is very true in reviewing analysis presented by the Department of Defense as well as other agencies of the government. Some of these graphs look like straight lines, others look like smooth curves, but most, and above all those representing economic data, give the impression of the haphazard scrawlings of a three-year-old child. With the use of statistics and time series methodology order can be brought to the patterns and the seemingly erratic appearance of the basic data. The classical time series multiplicative model was used in this analysis.

$$Y_t = T_t \times S_t \times C_t \times I_t$$

The fluctuations of a time series can be classified into

four basic types of variations which, superimposed and acting all in concert, account for the changes in the series over a period of time and give the series its irregular appearance [Boot, 1974]. These four patterns, movements, or, as they are often called, components of a time series are:

1. The Trend (T_t)
2. Seasonal Variation (S_t)
3. Cyclical Variation (C_t)
4. Irregular Variation (I_t)

When speaking of the trend of a time series it ordinarily means the smooth or regular movement of the series over a fairly long period of time. Intuitively speaking, the trend of a time series displays the general sweep of its development, or better, it characterizes the gradual and consistant pattern of its changes.

The seasonal variation may perhaps be the easiest to understand consisting of regular repeating patterns. Although the name implies a connection with seasons of the year , it is used to indicate any kind of variation which is of periodic nature and where the period is not longer than one year.

Irregular or erratic fluctuations of a time series are those variations which are either completely unpredictable or which are caused by such isolated special occurences as good and bad news, bank failures, elections, floods, earthquakes, strikes, and wars. Some influences which can be classed as erratic are barely noticeable, working themselves out before much of anything is felt.

From one point of view, the so-called business cycle is

nothing more than the variation that remains in a time series after the trend, seasonal variation, and irregular variation have been eliminated. More generally it might be said that the cycle consists of recurrence of the up and down movements of activity from some sort of statistical trend or "normal." Normal implies the same kind of statistical average which tends to generalize an observation. The essential difference between seasonal and cyclical effects is that seasonal effects are predictable, occurring at a given interval of time within a year from the last occurrence. Cyclical effects are less predictable in that the length of the cycle must literally be guessed by cogitating over the data and making trial and error runs.

Defining these four movements as those which make up the time series is an assumption which is not universally agreed upon. Some economists feel that the given classifications are too crude, that there are, in fact, more than four types of movements. It is further noted that the effects of these four types of movements may not be separable. They may be additive, multiplicative, or they might be combined in any one of an indefinitely large number of ways. (The reader that is inclined to seek more in time series analysis will eventually end up in Fourier transforms.)

VIII. ANALYSIS

The data used for this time series analysis of the DOD financial activities was from monthly reports of obligations, outlays, and expenditures for the five most recent years available (fiscal years 1971 - 1976). Monthly outlays by the Department of Defense were collected from the report rendered by the Office of the Secretary of Defense (Comptroller) entitled, "Monthly Outlays by Appropriation Title." These reports are commonly called FAD reports, FAD indicating Finance and Accounting Division. As in any comprehensive report of financial summaries there were numerous subtotals and totals throughout the report. The figures used in this analysis included the total dollar figure for all military functions excluding Military Assistance Program Federal funds.

Caution was exercised in using figures from these reports. Recalling earlier discussion of the composition and definition of an outlay, an outlay from an agency, in this case DOD, may not mean an expenditure which effects the economy at the time of the outlay. Outlays are recorded when checks are issued. Recipients might not cash these checks immediately upon receipt. Actual outlays (expenditures) may be reflected in a later time period and even in the next fiscal year. Some outlays take place as payments to another Federal agency. These outlays will have a zero effect upon the total Federal expenditures in that they merely cause a transfer of funds between agencies and no money is directly going to the economy.

To obtain data on the monthly expenditures and

obligations, figures were taken from the "Monthly Statement of Receipts and Outlays of the United States Government" which is published by the Treasury Department. Outlays by the Treasury Department are recorded as checks clear through the Federal Reserve Banks. It is at this time we know the money has entered the economy and would be measured as M1. Obligations incurred for national defense were tabulated in dollar figures and were extracted from the monthly Treasury statements containing the expenditure data. Although the inclusive categories composing these total obligation figures were not available, there was no loss in the relevance of the analysis at its level of aggregation since the results were used to evaluate or characterize the role that obligations play in this control process.

The data collected was not adjusted or manipulated in any way, other than conventional rounding-off techniques. Due to the nature of this study it would not achieve any additional advantage or would not eliminate any biases by adjusting for calendar variation, price changes, and population changes which are considered the normal adjustments prior to analysis. Calendar changes require adjustment to a thirty day calendar for all months. This step was not taken due to the nature of our budgetary system which is highly responsive to the change of month and subsequently that of quarters and to smooth all the months might have caused the loss of a seasonal or cyclical effect which we were attempting to identify.

Adjusting for price changes would not have assisted this analysis and may even have caused a loss in time series component identity. Adjustments for population were not relevant in this study and were not considered.

A. THE TREND

When one tries to describe the overall movement of a time series he generally thinks of a smooth curve of some sort. The simplest curve to visualize, or to fit, is the straight line. The most widely used method for fitting the trend is the method of "least squares" using the regression tool of analysis as described by the following model:

$$Y' = a + bx$$

The value (x) represented the time period to which the measurement value (Y) refers. Regression requires that the sum of the squares of the differences between the actual values outlays and obligations (Y) and the calculated trend values (Y') be a minimum. That is, in the linear equation:

$$Y' = a + bx$$

a and b will have to be chosen such that:

$$\sum (Y - Y')^2$$

is a minimum. Figure 10 shows the results of the regression line for DOD outlays from the FAD reports along with the actual values of those outlays. The results yielded:

$$Y' = 5.76 + .0292x$$

The trend is an intuitively appealing concept and also provides us with a tool to facilitate additional steps in

the time series analysis. As expected, it was upward sloping to the northeast determined by the estimated coefficients a and b.

The second part of the regression analysis was to ask the question, "how good is the fit of this line to the data used?" A very useful measure of dispersion is given by the coefficient of determination (R^2) which shows the proportion of total variance accounted for by the estimating relationship of the explained variance to the total variance. When all the observed points in the sample are on the least-squares line (trend line), the coefficient of determination equals 1 and there is no unexplained or residual variance. In the analysis of the DOD outlays (figure 10) the R^2 equaled .4816. This was a very low value indicating a less than good fit.

The results from the regression analysis of the Treasury reported outlays (expenditures) by DOD (figure 11) yielded:

$$Y' = 5.75 + .0297x$$

The reported obligations incurred (figure 12) yielded:

$$Y' = 6.19 + .0558x$$

The third part of the regression analysis was to consider the degree of dependence the observed data had on each other. It is sometimes found that high or large values seem to perpetuate large values and low values perpetuate low values. If this condition existed it would tend to devalue the usefulness of our regression analysis using the existing observations. The Durbin-Watson test for serial

correlation was used to evaluate this level of dependence with the following model:

$$d = \frac{\sum (e_i - e_{i-1})^2}{\sum e_i^2}$$

were:

$$e_i = (Y_i - Y'_i)$$

The Durbin-Watson results gives:

$$d = 2.103$$

which is indicative of no serial correlation. The 95% significant inconclusive region of the Durbin-Watson analysis existed between the points 1.47 and 1.54. These results allowed us to continue with confidence in the usefulness of the data.

B. THE SEASONAL

With the regression line (the trend) established, the foundation for continued analysis was set. The technique used for calculating the seasonal index was based on determining a figure which represented each month expressing it as a percentage of the average month in the five year period. For example, if the seasonal index for the month of April was 91.5, this meant that April outlays (or obligations) were 91.5 per cent of those of the average month.

There are many methods for obtaining seasonal indexes. The one used in this study was the "ratio-to-moving average"[Fruend, 1969]. This technique clearly separated the seasonal and trend components, was flexible in case of non-linear trends, and in the presence of short time spans, 5 or 10 years, moving averages were easier to use to describe trend and cyclical variations rather than specific mathematical curves.

The first step was to compute the twelve-month moving average, which completely eliminated any patterns which regularly repeat year after year, for the sixty periods. This was accomplished by adding the values of the first twelve periods and dividing to obtain the average. This value was then identified with the sixth period. The value for the seventh period resulted from the average of the values for periods two through thirteen inclusive. The eighth period value was from periods three through fourteen, and so on.

For each period which had a twelve-month moving average value (periods 1-6 and 55-60 did not have these values due to this technique of averaging) the percentage of moving average was determined. The percentage of moving average is designed to eliminate the trend and cyclical components for our data, thus leaving seasonal and irregular variations as the only variations. The percentage of moving average was determined by dividing the actual observed value of our outlay by the twelve-month moving average and multiplying that value by 100.

C. IRREGULAR VARIATION

All that remained to be done was eliminate, so far as

possible, the irregular variation by averaging the respective values obtained from the different months. Figure 13 shows the tabulation of the seasonal index for DOD outlays. It is noted that there were only four values for each month since the moving average failed to provide averages for the first half of fiscal year 1972 and the last half of fiscal year 1976 as already mentioned. The median method of averaging was used for determining the individual month values. Since the total percentage should total 1200 (100 for each month) a correction factor was computed and applied to each value. In this case the correction factor was $1200/1203.59 = .997$. The seasonal index of 86.7 for July indicated the July outlays were 86.7 percent of the overall average monthly outlays, August outlays were 101.99 per cent of the overall average monthly outlays, and so on. Figure 14 shows the graphic results of the seasonal index. As could be expected the seasonal resulting from the Treasury reported DOD outlays (figure 16) is very similar to those reported by DOD indicating that a standard pattern for check clearing time has developed between the Treasury and the business community as a whole. Figure 15 shows the tabulated computations. The seasonal for the incurred obligations is illustrated in figure 18 with the tabulated computations in figure 17.

D. CYCLICAL VARIATION

The cyclical variation was isolated by eliminating the other three components. The method used was the "residual method" [Fruend, 1969]. First the data was adjusted for trend and seasonal variation. This adjustment was made by dividing out the trend and seasonal variation arriving at cyclical-irregulars. The irregular variation was then removed resulting with cyclical relatives.

Trend and seasonal adjusting was achieved by multiplying the trend value of each period times its appropriate seasonal index giving the "normal." The "normal" is the value to be expected if the trend and the seasonal forces were the only contributing factors to the series. The next step included dividing the actual DOD outlay value by the normal and multiplying by 100. This resulted in the "cyclical-irregular" which may also be called "percentage of trend." To isolate the cyclical component completely, insofar as this is possible, irregular variations were eliminated by using a weighted three-month moving average. This technique avoided averaging (smoothing) out too much variation while still accomplishing the elimination of irregular variation. The weighted moving average was calculated by adding the cyclical-irregular value of the preceding and following period to twice the value of the current period and dividing the results by four. The result was a cyclical relative value which again can be called a "percentage of trend" in this case without irregular variations. Figure 19 shows the cyclical plotted with the trend.

These steps were performed with the Treasury data and the incurred obligations and are illustrated in figures 20 and 21 respectively.

IX. SUMMARY AND CONCLUSIONS

Deep concern, almost to the level of alarm, over the amount of defense spending and underspending should be tempered with an appropriate degree of expectation based on the cumulative components of fiscal policy guidelines from the Executive, fiscal policy requirements from the Legislature, and fiscal objectives stated by the Secretary of Defense. To rely on the predicted results of one component not considering the influence of the other components is likely to result in an inaccurate conclusion. The applicability of time series analysis in such a complex entity as the defense expenditure process with so many participants is very pertinent in facilitating the combined consideration of all these elements.

The analysis supports the conclusion that the Treasury report of DOD outlays is an accurate representation of the DOD outlays based on the results from the regression analysis. Virtually the same trend line, seasonal variation, and cyclical variation existed in both reports. The concern over a time lag between DOD outlays and the Treasury report of these is not supported with the results. Further verification of similarity is obtained by viewing figures 10, 11, 14, 16, 19, and 20.

In evaluating the trends of outlays and obligations an attempt was not made to analyze any deeper than mere comparison of patterns since the coefficient of determination indicates a poor comparative trend fit. The trend in obligations was a greater sloping line than that for outlays. This might be indicative of the availability

of multi-year obligational authority. Some cautions must be added concerning regression analysis when applied to time series. Most of the assumptions, such as independence, normality, and constant variance are usually not relevant to time series data. Thus it is impossible to attach a measure of statistical confidence to the prediction made from the trend line, however the real worth of time series analysis in this area is in the seasonal implications.

The greatest variation in components was seen indeed in the seasonal variations represented as a percent of the trend. At the begining of a fiscal year we see the outlays rapidly increased from a low level which would tend to reflect the receipt of funds from the new appropriations bill, a significant point being the existance of a very low level of outlays at the begining of a fiscal year (86.7% of the trend). This predominant seasonal result might indicate an institutional inertia in the agency and national economy's behavior concerning outlays capable of overriding such strong influences as Presidential and Congressional planning for the transition quarter. When so many participants conduct their operations consistant with the seasonal variation, it might be too much to expect a high level of spending in the early months of a fiscal year even when the emphasis is placed in that direction.

On the contrary, the level of obligations was very high at the begining of a year, declines, and then is very high at the end of the fiscal year. The data supported the common belief that there is much obligating at the end of a year.

The obligational seasonal also showed much more regular variation than did the outlay seasonal. How do we interpret this, or is there an explanation? The answer to this question lies in the nature and duration of these

obligations. Short term obligations would likely follow seasonal changes, construction and repairing for the spring and summer months while procurement may not follow any seasonal pattern. The disaggregation of defense obligations and outlays to appropriations accounts would be an area for further analysis.

The cyclical variation was very difficult to evaluate especially when so erratic as is the case with this data. Taxing the perception to the fullest extent one might claim that the obligational cyclical variation was fairly regular with a complete cycle lasting six months with peaks at the July-August-September period and January-February-March time period. The outlay cyclical did not give way to any real definitive cycle for evaluation. An interesting observation was that the cyclic obligation peaks occurred roughly just a month before the cyclic outlay peaks when they do occur. If we accept the premise that regularity in cyclic variation would imply the least effective control device, we would then have to conclude that outlays show more potential as a policy control variable than do obligations.

The peak periods in obligations suggested regularity in winter months which could be a result of increased construction and repair planning and the summer months which coincided with the close of the fiscal year. These peak periods coincided very closely with the seasonal variation which more strongly reinforced the obligation pattern as a highly regular instrument. This further negated the belief of policy influence being a prevalent factor in the obligation arena of budget execution.

In this analysis an attempt to identify budget execution control as a policy control variable with time series analysis was pursued. The budget execution process did not appear to be a highly responsive policy tool. A highly

responsive control variable would have resulted in definite non-regularity in the observed components of the time series. A high degree of regularity existed within DOD ~~✓~~ obligations and a lesser degree in DOD outlays. Addressing the obligation/cash management question, the results showed the least regularity in the outlays. This implies a greater tendency for the cash management oriented businessman to be more impacted by federal government fiscal policy. Further evaluation of business operations in this area should be done to draw a more definite conclusion.

Areas for further study include an analysis of decision techniques used by business entities who deal with DOD contracting at all dollar volume levels both in the short term and long term. Further analysis over the new fiscal year time period should indicate the validity of the results obtained in this analysis. The variations may continue as they did in the historical data or some results should shift to meet the new fiscal year time table. The new fiscal year may also enhance the seasonal and/or cyclic characteristic of high winter and summer obligations and outlays. This analysis was highly aggregated. Another technique which might be pursued is a highly disaggregated study focusing on one appropriation account, or possibly comparing two different accounts.

This study reviewed the DOD budget execution process from enactment of the appropriations bill to the writing of government checks for services rendered. It also followed an exercise in time series analysis of DOD outlays and obligations. The complex problem of budget execution control will continue to be a major concern of the budgetary process. This analysis reduces some of the complexity in understanding the budget execution process by providing a framework and a method for future research.

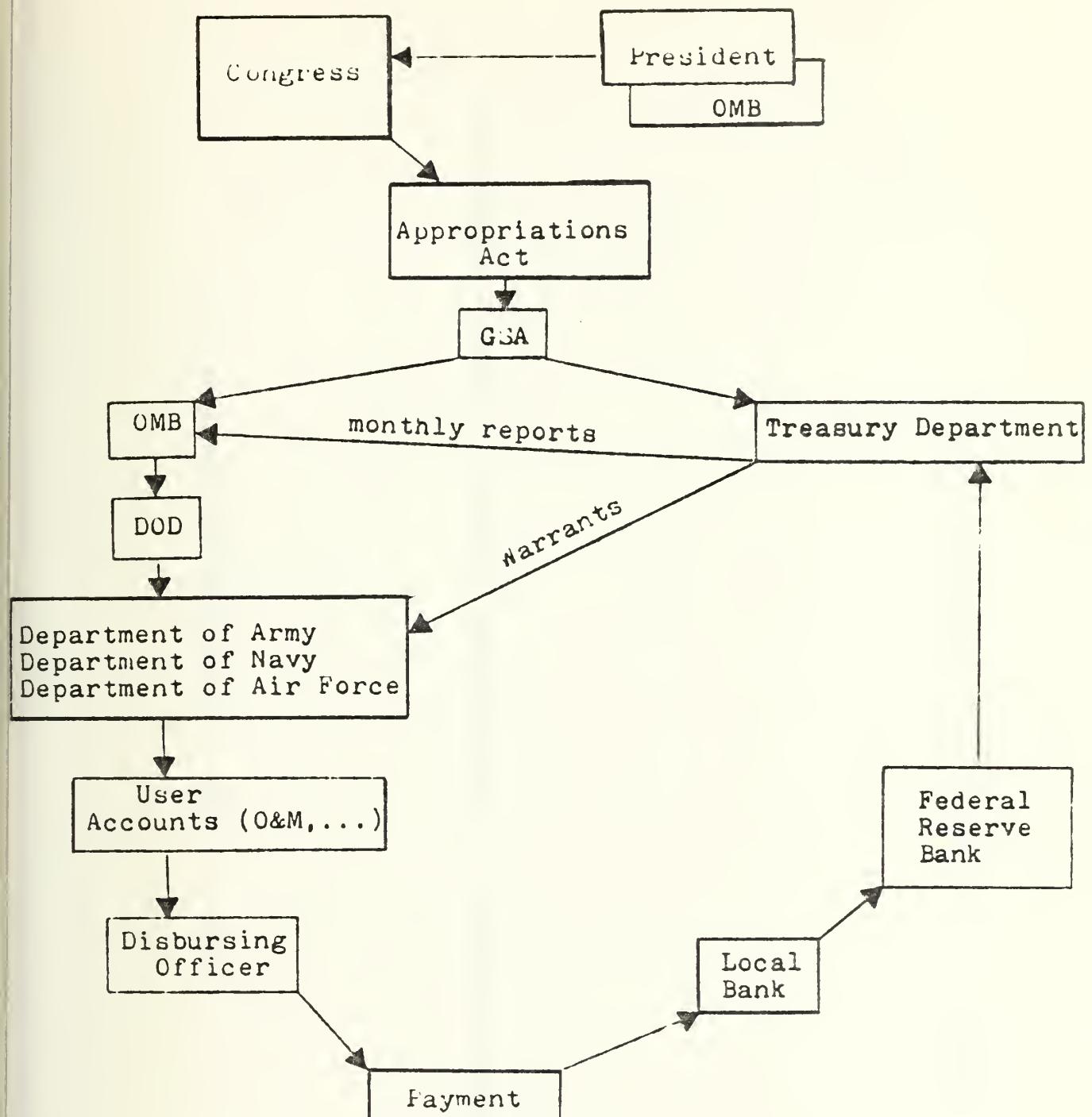


Figure 1 - ELEMENTS IN THE BUDGET EXECUTION PROCESS

$$TOA = NOA + Unobligated\ Balances$$

$$Unexpended\ Balances = Unobligated\ Balances + Unspent\ Obligations$$

Figure 2 - COMPOSITION OF EXPENDITURE FUNDS

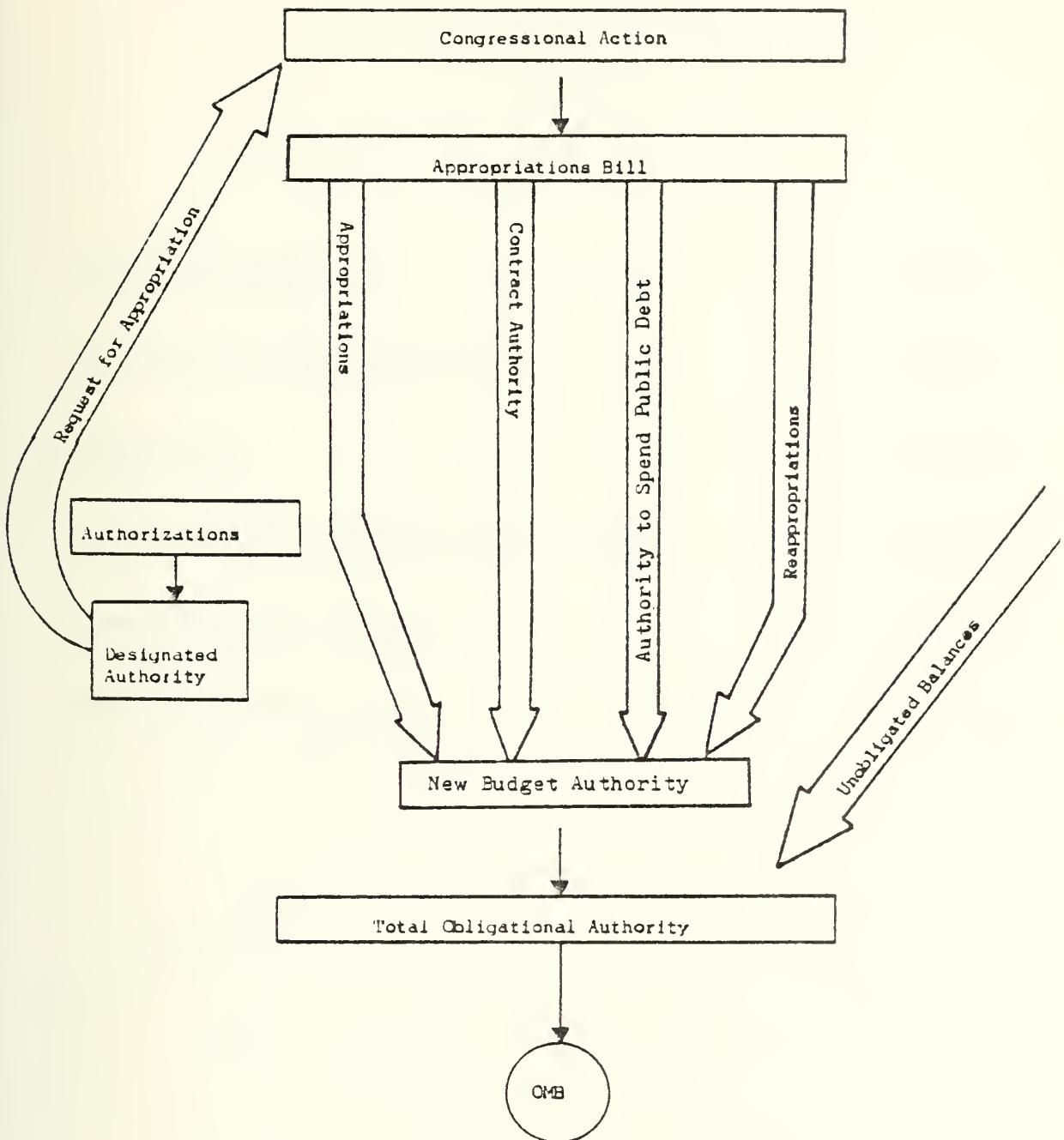


Figure 3 - FROM APPROPRIATIONS TO TOTAL OBLIGATIONAL AUTHORITY

Military Personnel	1 Year
Operations & Maintenance	1 Year
Procurement	3 Years
Shipbuilding & Construction (Navy)	5 Years
Research & Development	2 Years
Military Construction	2 Years

Figure 4 - APPROPRIATIONS ACCOUNTS AND TIME LIMITATIONS

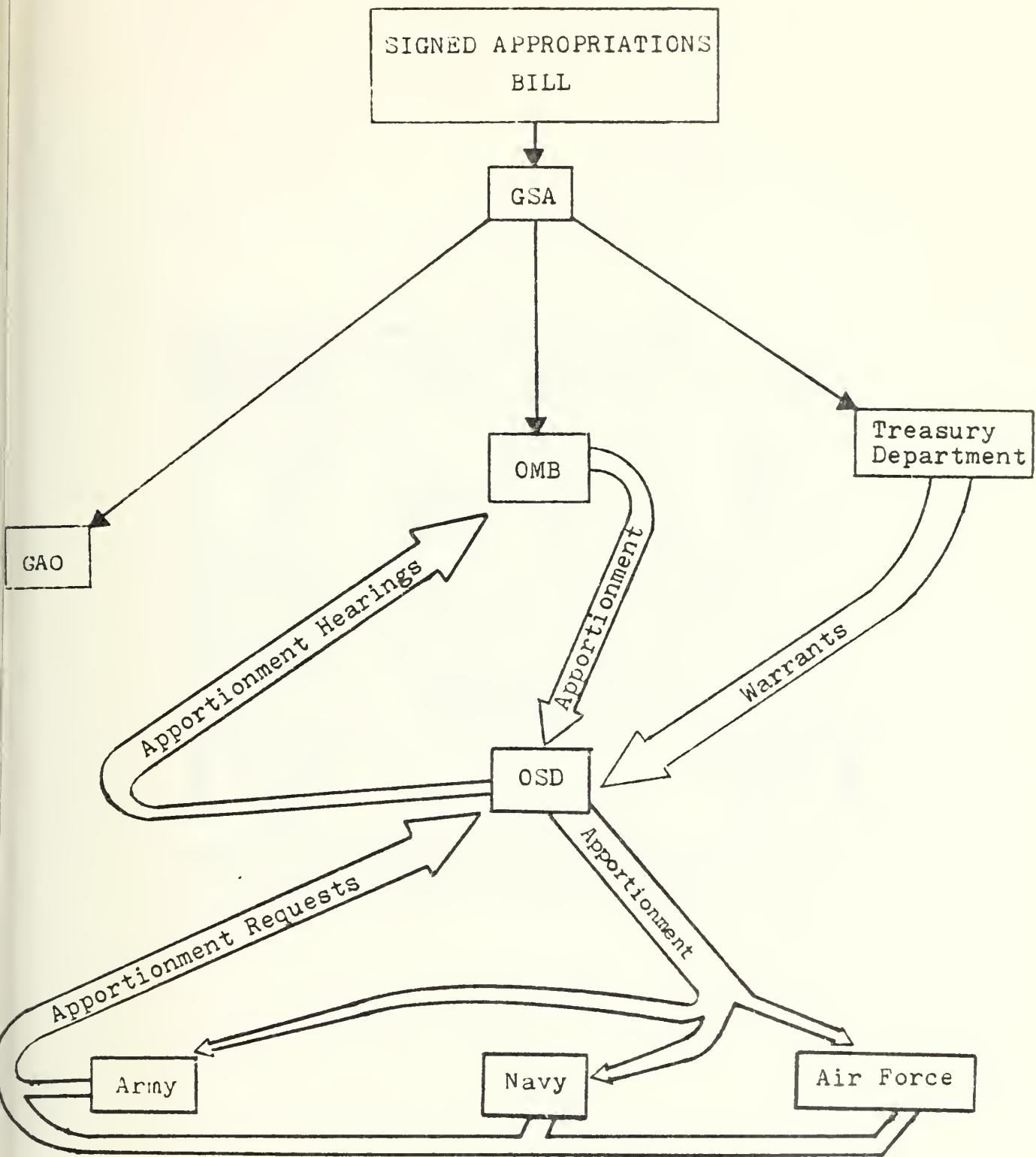


Figure 5 - APPROPRIATIONS TO APPORTIONMENT

Relation of Budget Authority to Outlays — 1976 Budget

Figures in brackets represent Federal funds only

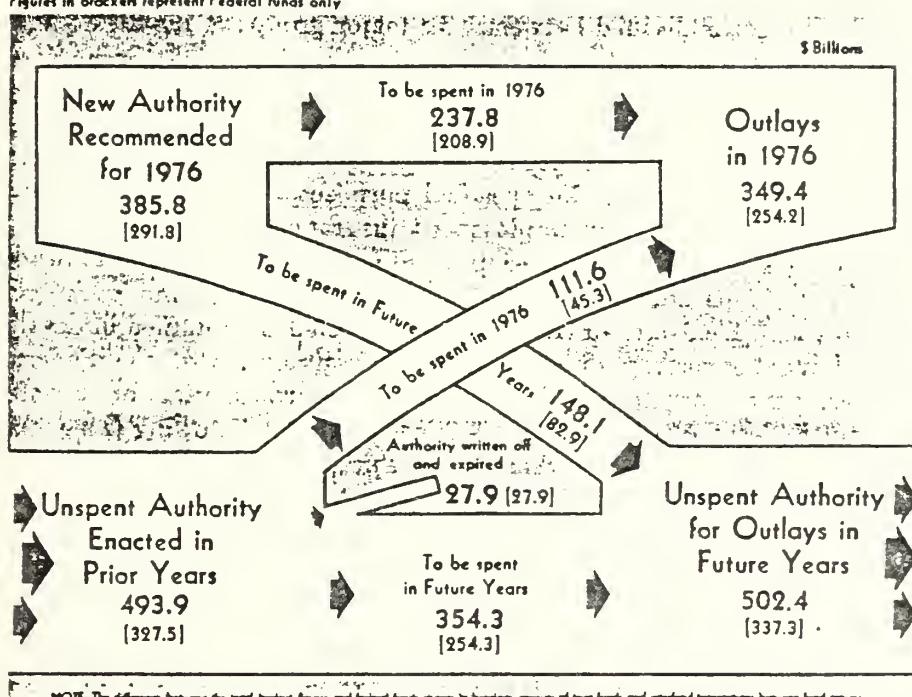


Figure 6 - RELATION OF BUDGET AUTHORITY TO OUTLAYS

Fiscal Year	Military Personnel	Operation & Maintenance	Procurement	RDT&E	Total
1956	158	455	1515	N/A	2128
1957	85	214	2056	N/A	2355
.....
1961	N/A	N/A	2796	994	3791
1962	N/A	N/A	1482	426	1908
1963	N/A	N/A	913	862	1775
1964	40	219	1272	473	2008
1965	63	230	1256	434	1985
1966	75	230	1552	495	2253
1967	191	398	2234	549	3373
1968	181	121	3899	596	4797
.....
1970	N/A	N/A	N/A	N/A	2431
1971	366	585	1701	523	3266
1972	328	534	654	164	1680

Figure 7 - EXAMPLE OF REPROGRAMMING ACTIVITY (\$MILLION)

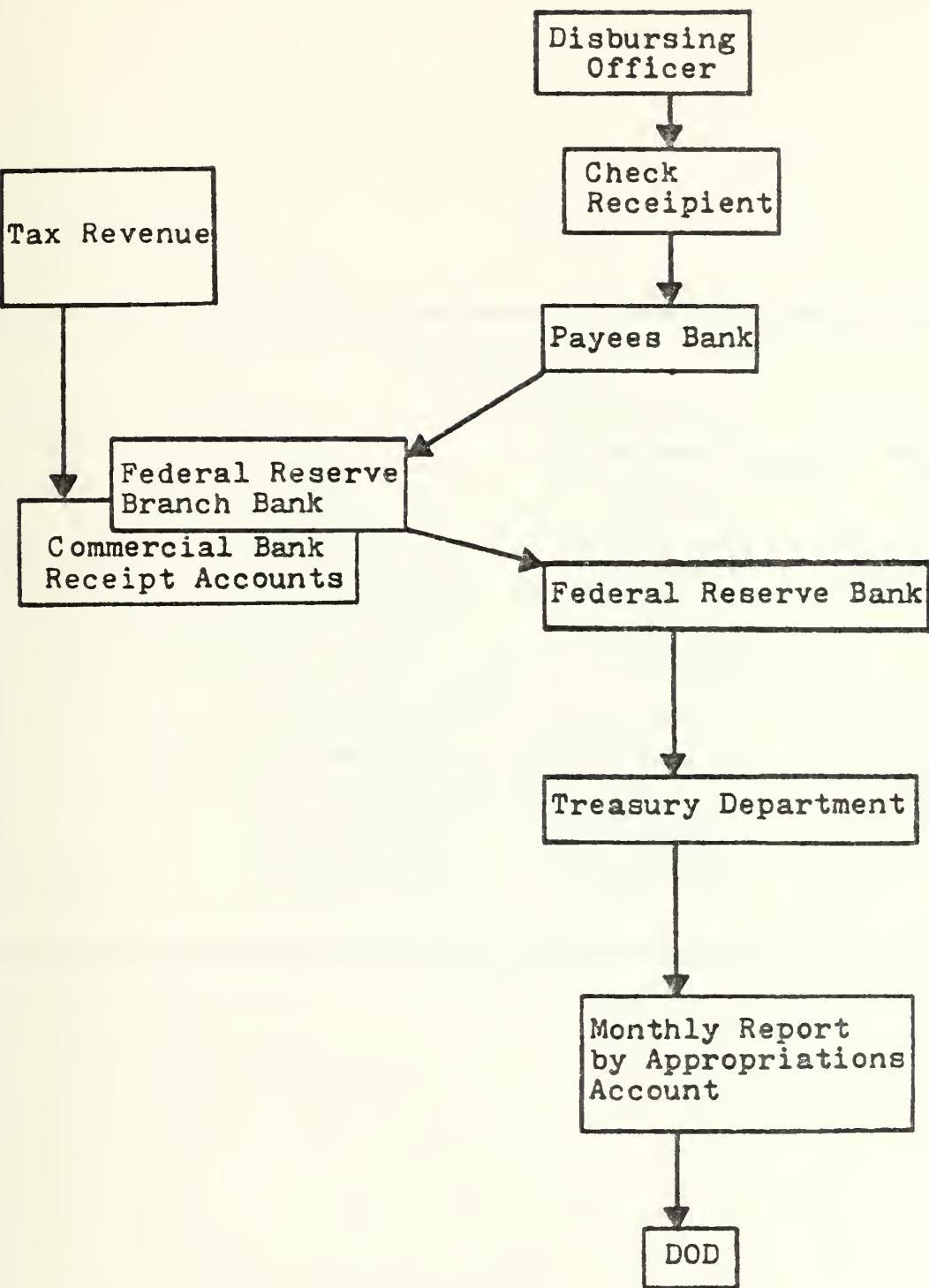


Figure 8 - FLOW OF DOD FUNDS IN THE FEDERAL RESERVE SYSTEM

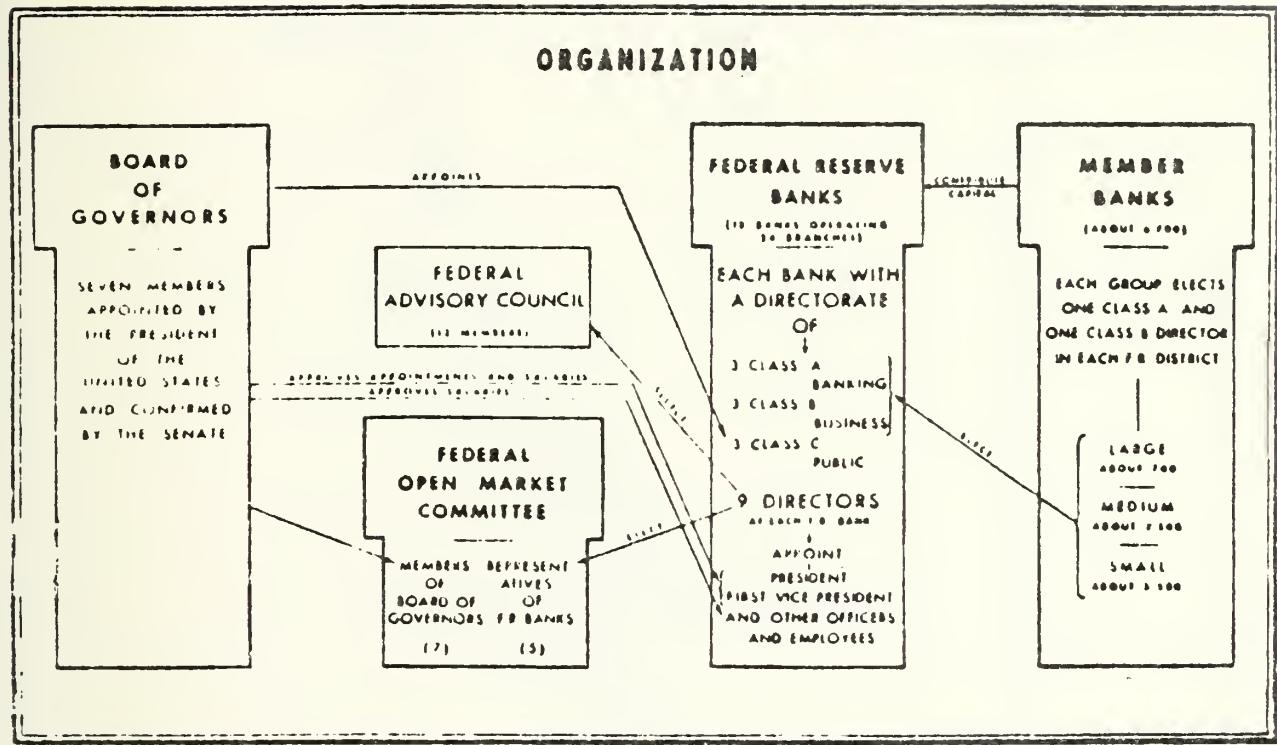


Figure 9 - ORGANIZATION OF THE FEDERAL RESERVE SYSTEM

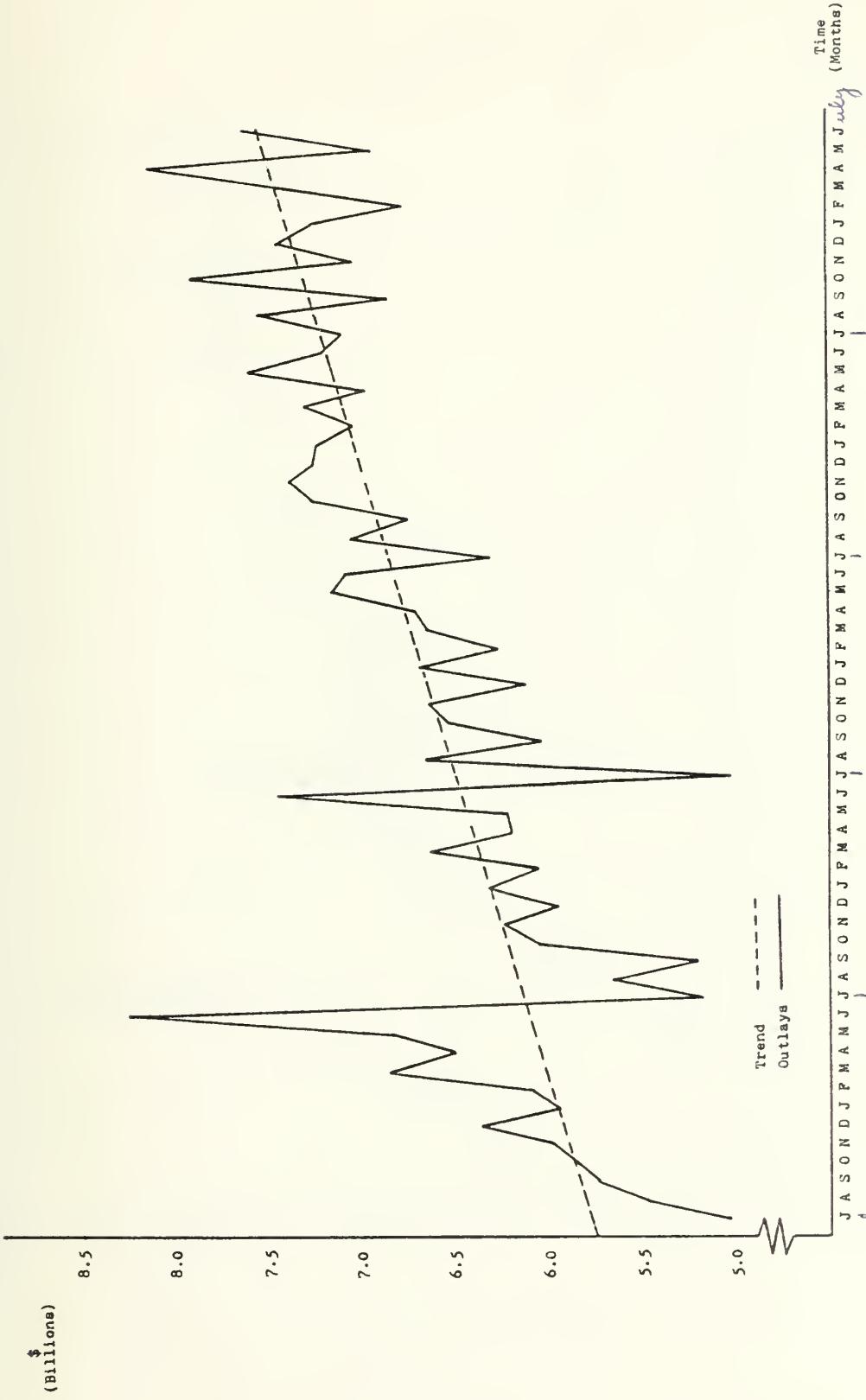


Figure 10 - DOD OUTLAYS AND THE TREND FY 1972-1976

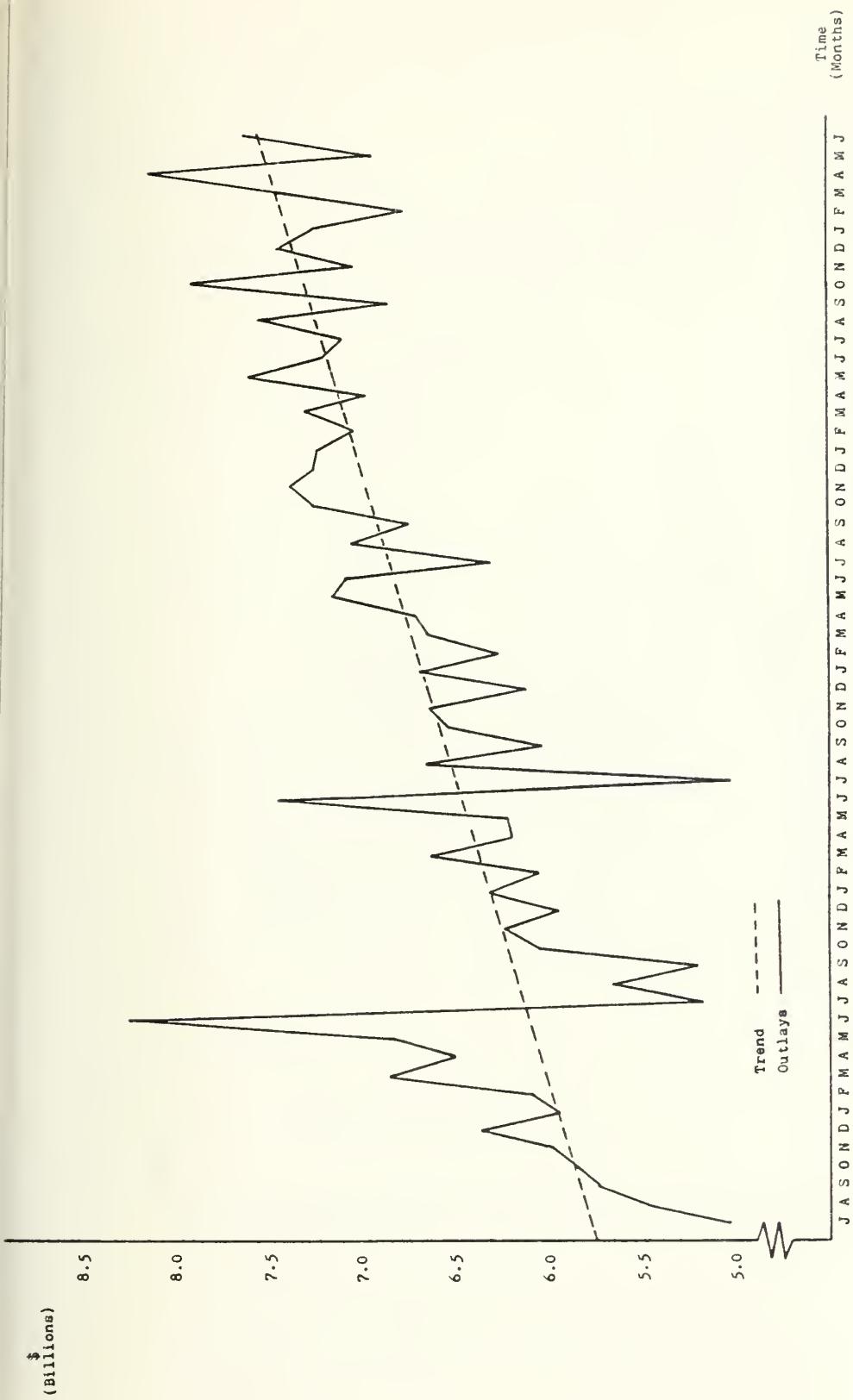


Figure 11 - TREASURY REPORT OF DOD OUTLAYS AND THE TREND FY
1972-1976

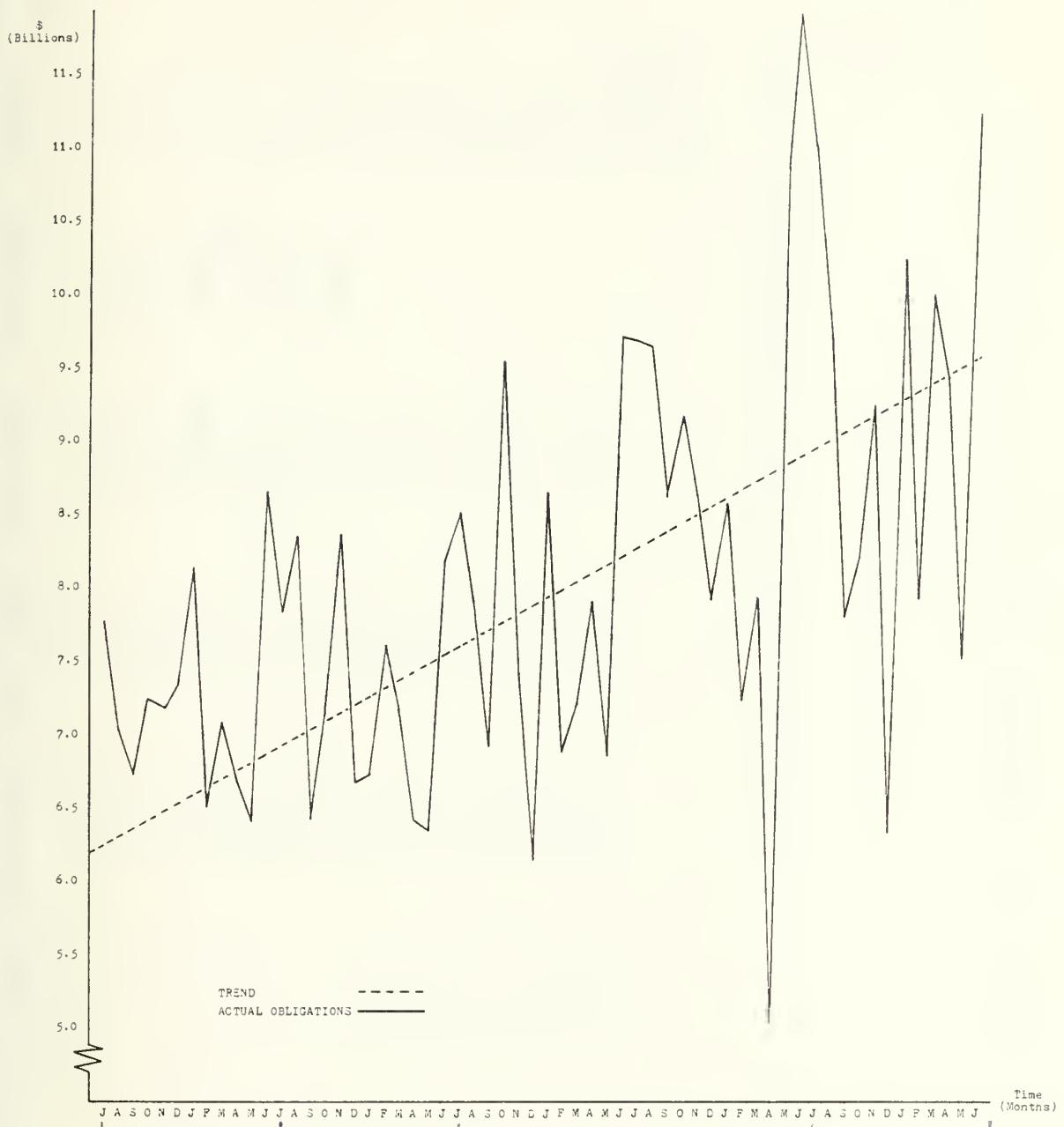


Figure 12 - DOD OBLIGATIONS AND THE TREND FY 1972-1976

	FY 1972	FY 1973	FY 1974	FY 1975	FY 1976	Median (W x CF)
July	82.8	79.1	91.2	97.9	87.0	86.7
August	90.3	104.4	101.2	103.4	102.3	101.99
September	83.2	94.5	95.98	94.2	94.32	94.1
October	97.4	101.6	102.7	107.97	102.15	101.8
November	101.2	102.3	104.2	96.2	101.75	101.4
December	97.7	94.7	102.1	101.5	99.84	99.5
January	95.1	103.9	101.7	99.9	99.6	99.3
February	97.1	98.3	95.1	97.7	97.4	97.1
March	110.1	106.2	99.9	100.3	103.25	102.9
April	103.98	98.8	99.6	96.02	99.2	98.9
May	109.4	98.7	105.6	104.4	105.0	104.7
June	132.4	118.0	103.1	99.1	110.55	110.22
						1203.59

Correction Factor (CF) = 1200/1203.59 = .997

Figure 13 - SEASONAL COMPUTATION FOR DOD OUTLAYS FY
1972-1976

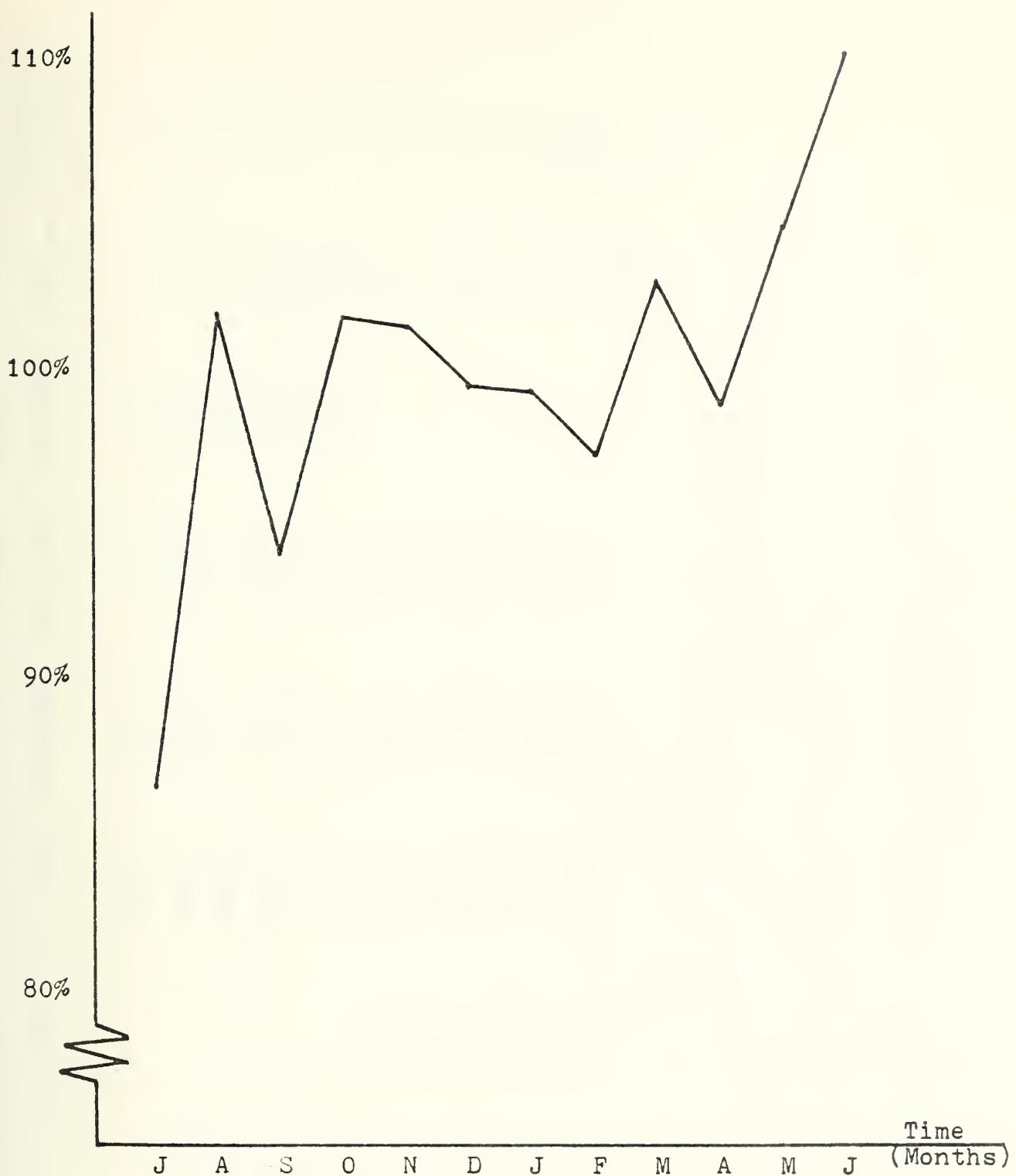


Figure 14 - SEASONAL VARIATION FOR DOD OUTLAYS FY
1972-1976

	FY 1972	FY 1973	FY 1974	FY 1975	FY 1976	Median (M x CF)	Seasonal Index
July	82.8	79.1	91.1	97.5	86.95	86.6	
August	90.3	104.4	100.97	104.0	102.48	102.1	
September	83.2	94.5	95.7	94.5	94.5	94.2	
October	97.4	101.7	102.7	107.3	102.2	101.8	
November	101.2	102.2	103.9	96.4	101.7	101.3	
December	97.7	94.6	101.9	101.5	99.6	99.2	
January	95.1	103.9	101.7	100.6	101.15	100.8	
February	97.1	98.3	94.7	97.5	97.3	96.9	
March	110.1	106.2	99.89	100.9	103.55	103.2	
April	103.98	98.7	99.6	95.9	99.15	98.9	
May	109.4	98.7	105.6	105.0	105.3	104.9	
June	132.3	118.01	103.4	99.1	110.5	110.1	
					<u>1204.41</u>		

Correction Factor (CF) = 1200/1204.41 = .996

Figure 15 - SEASONAL COMPUTATION FOR TREASURY REPORTED DOD OUTLAYS FY 1972-1976

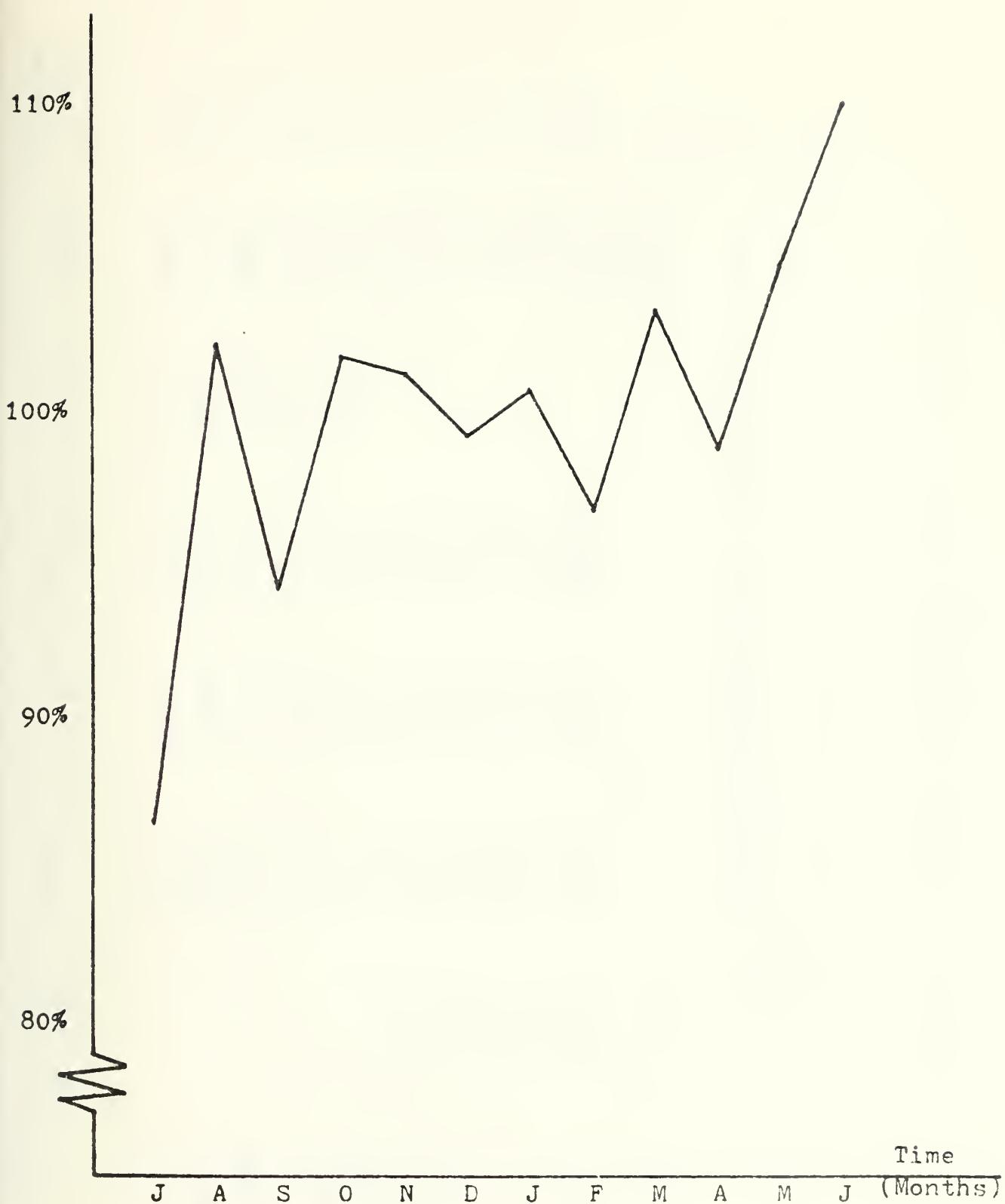


Figure 16 - SEASONAL VARIATION FOR TREASURY REPORTED DOD OUTLAYS FY 1972-1976

	FY 1972	FY 1973	FY 1974	FY 1975	FY 1976	Median	Seasonal Index (M x CF)
July	108.3	112.3	115.3	125.2	113.8	115.8	
August	113.8	105.2	114.5	109.7	111.75	113.7	
September	87.7	92.1	101.5	86.4	89.9	91.5	
October	97.7	125.01	111.2	87.5	104.45	106.3	
November	114.4	96.7	100.7	101.5	101.1	102.9	
December	91.9	78.7	90.3	69.9	84.5	86.0	
January	112.5	91.7	109.5	96.4	102.95	104.7	
February	88.5	104.3	85.6	81.4	87.05	88.6	
March	96.8	97.9	87.9	89.9	93.35	95.0	
April	91.1	85.3	96.9	57.6	88.2	89.7	
May	86.4	85.3	83.0	123.6	85.85	87.3	
June	117.7	110.5	115.3	137.8	116.5	118.5	
					<u>1179.4</u>		

Correction Factor (CF) = 1200/1179.4 = 1.017

Figure 17 - SEASONAL COMPUTATION FOR DOD OBLIGATIONS FY
1972-1976

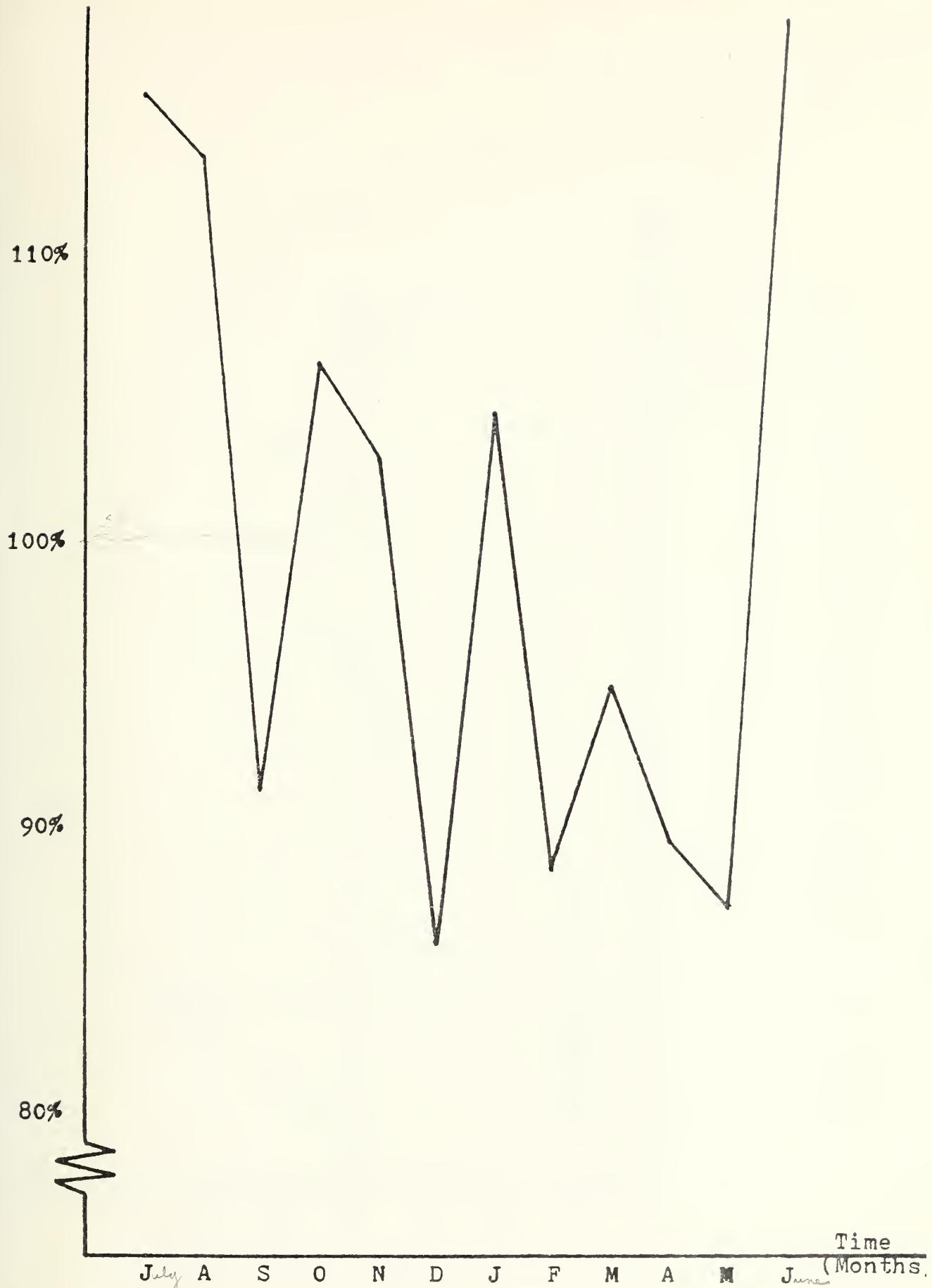


Figure 18 - SEASONAL VARIATION FOR DOD OBLIGATIONS FY
1972-1976

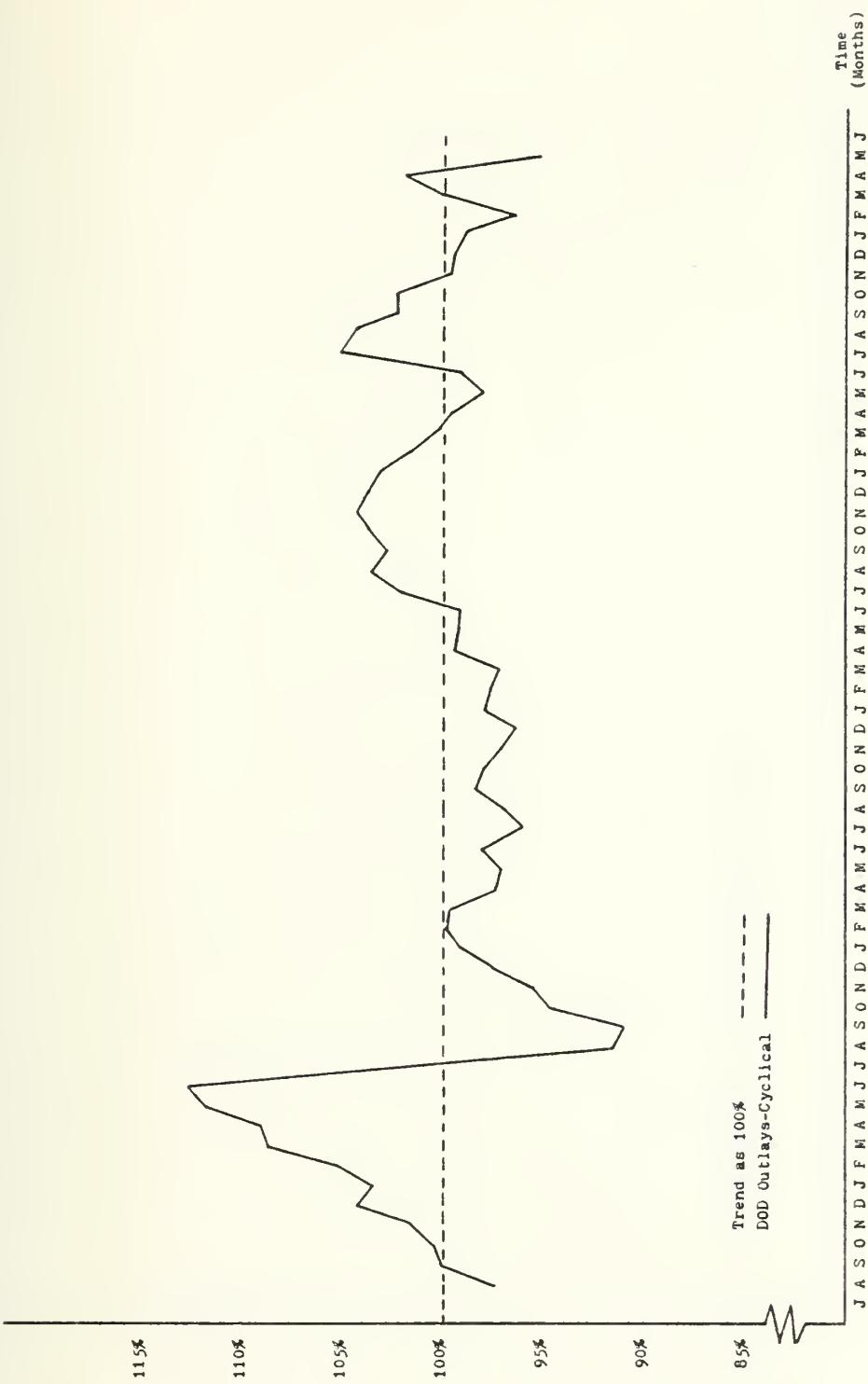


Figure 19 - CYCLICAL VARIATION OF DOD OUTLAYS FY 1972-1976

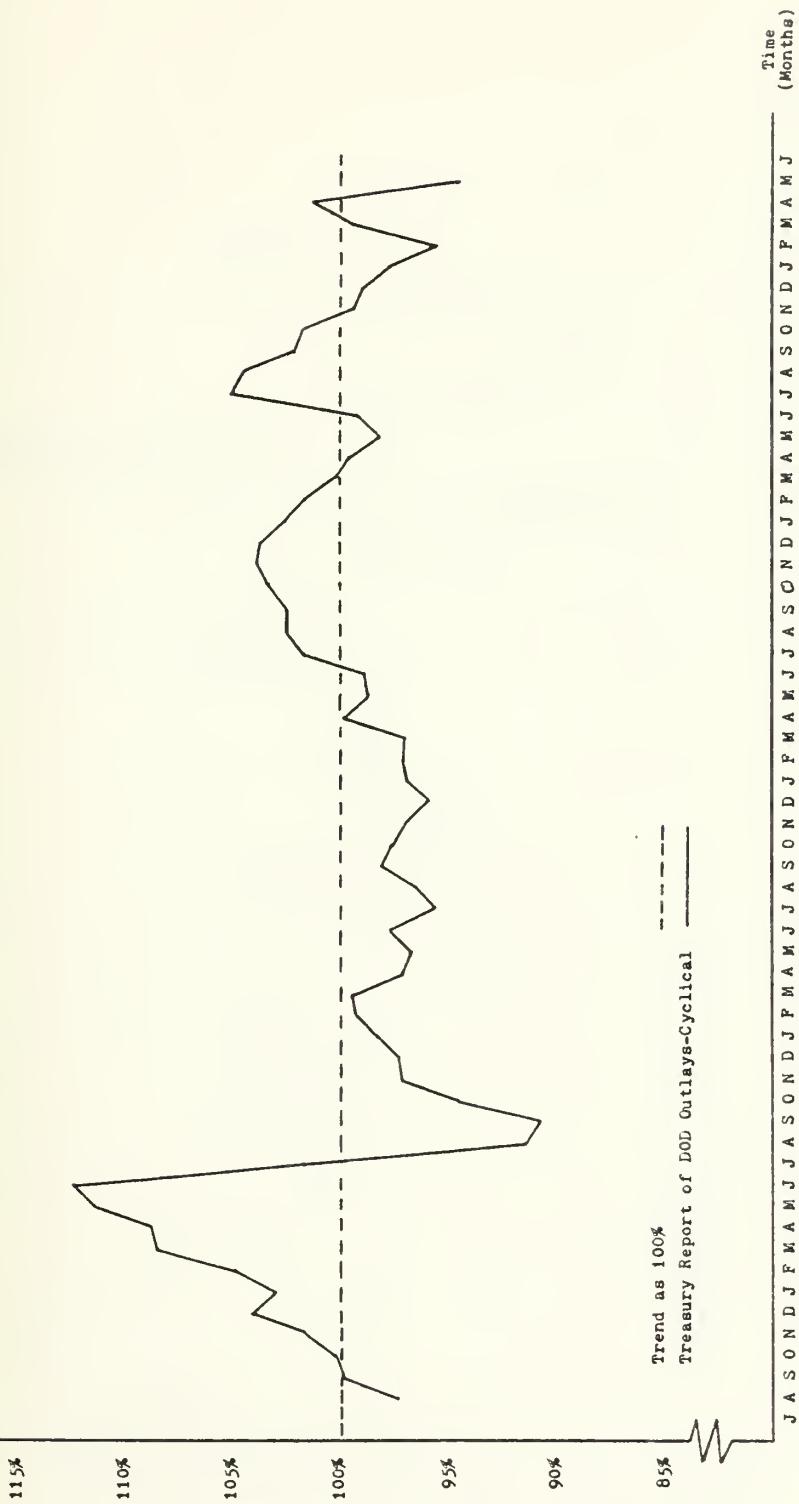


Figure 20 - CYCLICAL VARIATION OF TREASURY REPORTED DOD OUTLAYS FY 1972-1976

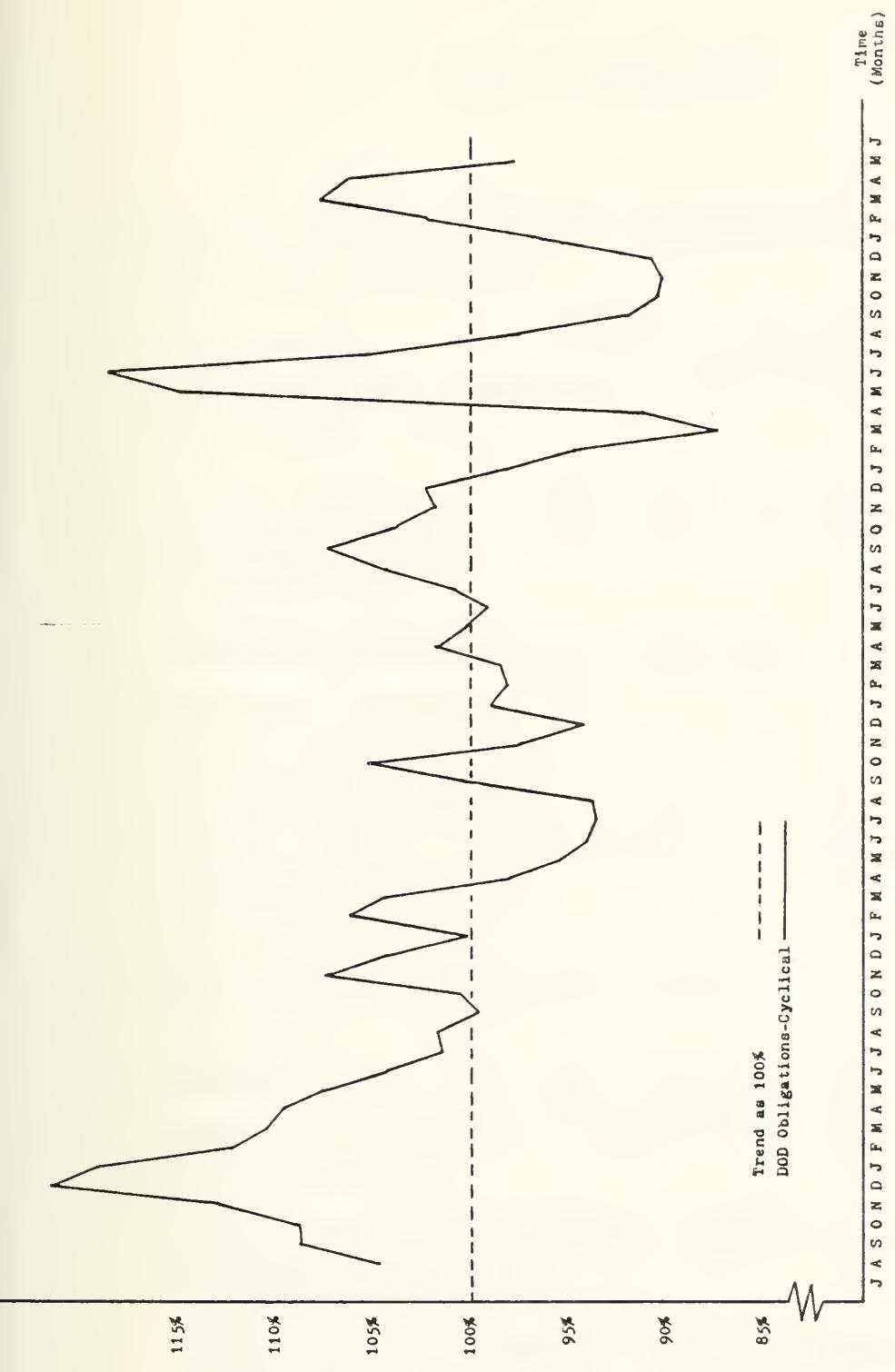


Figure 21 - CYCLICAL VARIATION OF DOD OBLIGATIONS FY

1972-1976

LIST OF REFERENCES

1. Aigner, Dennis J., Basic econometrics, Prentice-Hall Inc., New Jersey, 1971
2. Boot, John C. G.; Cox, Edward B., Statistical Analysis for Managerial Decisions, second editing, McGraw-Hill Book Company, 1974
3. Brown, Richard E., The GAO Untapped Source of Congressional Power, University of Tennessee Press, Knoxville, 1970
4. Burkhead, Jesse, Government Budgeting, John Wiley and Sons Inc., New York, 1956
5. Capra, James R., "Analysis of Data Describing Congressional Response to DOD Budget Requests", Ph. D. Thesis, Naval Postgraduate School, Monterey, California, June 1974
6. Dahlberg, Arthur, Money in Motion, John De Graff, New York, 1961
7. Department of the Army Pamphlet N. 37-4, "Army Comptroller Handbook", Headquarters, Department of the Army, April 1976
8. Fisher, Louis, Presidential Spending Power, Princeton University Press, 1975
9. Freund and Williams, Modern Business Statistics, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1969
10. Galper, Harvey and Edward Gramlick, "A Technique for Forecasting Defense Expenditures", The Review of

11. Hearings before the Committee on the Budget, House of Representatives, "Federal Outlay Shortfall for Fiscal Year 1976 and the Transition Quarter", 94th Congress, Second Session, U. S. Government Printing Office, 1976
12. Hicks, Charles R., Fundamental Concepts in the Design of Experiments, Holt, Rinehart and Winston, New York, 1973
13. Huzar, Elias, The Purse and the Sword, Cornell University Press, 1950
14. Joint Study Committee on Budget Control, "Recommendations for Improving Congressional Control Over Budgetary Outlay and Receipt Totals", House Special Reports, Report No 93-147, U. S. Government Printing Office, 18 April 1973
15. Key, Jr.; V. O., "The Lack of a Budgetary Theory", American Political Science Review, Vol. 34, 1940
16. Lapin, Lawrence L., Statistics for Modern Business Decisions, Harcourt Brace Jovanovich, Inc., San Francisco, 1973
17. Levy, Michael E., Smith, Delos R., "The Congressional Budget Process Again Reformed", The Conference Board Record, March 1975
18. Mosher, Fredrick C., Program Budgeting: Theory and Practice, Public Administration Service, Chicago, 1972
19. Nelson, Charles R., Applied Time Series Analysis for Managerial Forecasting, Holden-Day Inc., 1973
20. Office of Management and Budget Circular No. A-34, "Instructions on Budget Execution", Executive Office of the President, Office of Management and Budget, July 1976

21. Ott, David J. and Ott, Attiat F., Federal Budget Policy, The Brookings Institution, Washington D. C., 1969
22. Parker, John T., "An Inquiry into Defense Budgetary Reprogramming", Industrial College of the Armed Forces Journal, Winter 1974-1975
23. Prochnow, Herbert Victor, The Federal Reserve System, Harper and Brothers, New York, 1960
24. Scherer, Joseph; Papki, James A., Public Finance and Fiscal Policy, Houghton Mifflin Company, Boston, 1966
25. Senate Hearings before the Committee on Appropriations, The Budget of the United States Government Fiscal Year 1975, 93d Congress, Second Session, U. S. Government Printing Office, 1974
26. U. S. Board of Governors of the Federal Reserve System, The Federal Reserve System, Public Services Division, Administrative Services, September 1974
27. U. S. Congress, House, Committee on Appropriations, "Department of Defense Appropriations for 1969", Hearings, 90th Congress, 2d Session, 1968
28. U. S. Congress, House, "Message from the President of the United States Approving H.R. 6042, House Document No. 218, 84th Congress, 1st session, 1955
29. U. S. Department of Defense, Annual Defense Department Report, reports for fiscal years 1970-1975, U. S. Government Printing Office
30. U. S. General Accounting Office for the Committee on Government Operations U. S. Senate, "Financial Management in the Federal Government", Senate Document, No. 92-50, U. S. Government Printing Office, 1971

31. Warnke, Paul C., "The Case for a Sensible Defense Budget", Industrial College of the Armed Forces Journal, Winter 1974-1975
32. Weinberger, Casper W., The Defense Budget, American Enterprise Institute of Public Policy Research, Washington D. C., 1972
33. Wildavsky, Aron, The politics of the Budgetary Process, Little Brown, and Company, Boston, 1974

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